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ANNUAL REPORT

OF THE

ILLINOIS FARMERS' INSTITUTE

WITH REPORT OF

COUNTY FARMERS' INSTITUTES

FOR THE YEAR 1902.

ALLIED PRINTING TRADES UNION LABEL COUNCIL SPRINGFIELD 62

SPRINGFIELD, ILL.
PHILLIPS BROS., STATE PRINTERS.
1902.

LETTER OF TRANSMITTAL.

To His Excellency RICHARD YATES, *Governor of Illinois.*

SIR:—I have the honor to transmit the report of the Illinois Farmers Institute for 1901, and trust an inspection of its contents will satisfy you that the funds appropriated by the General Assembly for the advancement of useful education among the farmers, and for developing the agricultural resources of the State, have been wisely expended.

Respectfully submitted,
A. B. HOSTETTER,
Secretary.

WALTER R. KIMZEY, TAMAROA, ILL.
President of Illinois Farmers' Institute.

ILLINOIS FARMERS' INSTITUTE.

[CREATED BY ACT OF THE 39TH GENERAL ASSEMBLY.]

Officers February 26, 1901, to March 1, 1902.

President—Walter R. Kimzey	**Tamaroa**
Vice President—S. Noble King	**Bloomington**
Treasurer—A. P. Grout	**Winchester**
Secretary and Superintendent—A. B. Hostetter	**Springfield**

BOARD OF DIRECTORS.

Ex-Officio.

Superintendent of Public Instruction—Alfred Bayliss	**Springfield**
Dean of the College of Agriculture—Eugene Davenport	**Urbana**
President State Board of Agriculture—Martin Conrad	**Sherman House, Chicago**
President State Horticultural Society—Henry M. Dunlap	**Savoy**
President State Dairyman's Association—Joseph Newman	**Elgin**

ELECTIVE BY CONGRESSIONAL DISTRICTS.

1st	**District—***		
2d	"	W. R. Goodwin	**1106-358 Dearborn st., Chicago**
3d	"	Mrs. Sarah Steenberg	**145 LaSalle st., Chicago**
4th	"	J. M. Clark	**960 Warren ave., Chicago**
5th	"	Jas. Frake	**132 LaSalle st., Chicago**
6th	"	Wm. Stewart	**623 Dearborn ave., Chicago**
7th	"	H. D. Hughes	**Antioch**
8th	"	George A. Hunt	**Greenwood**
9th	"	Amos F. Moore	**Polo**
10th	"	J. H. Coolidge	**Galesburg**
11th	"	A. W. Bryant	**Princeton**
12th	"	F. I. Mann	**Gilman**
13th	"	S. Noble King	**Bloomington**
14th	"	Ralph Allen	**Delavan**
15th	"	G. W. Dean	**Quincy R. D. No. 1**
16th	"	A. P. Grout	**Winchester**
17th	"	Charles F Mills	**Springfield**
18th	"	E. W. Burroughs	**Edwardsville**
19th	"	D. H. Shank	**Paris**
20th	"	L. N. Beal	**Mt. Vernon**
21st	"	W. R. Kimzey	**Tamaroa**
22d	"	H. G. Easterly	**Carbondale**

STANDING COMMITTRES.

Executive Committee.

W. R. Kimzey, L. N. Beal, D. H. Shank,
James Frake, S. Noble King.

State Institute Meeting Committee.

W. R. Kimzey, Henry M. Dunlap, W. R. Goodwin,
H. G. Easterly. Chas. F. Mills.

Committee to Select Speakers to County Institutes.

J. H. Coolidge, A. W. Bryant, Joseph Newman,
A. P. Grout, W. R. Kimzey.

Legislative Committee.

Amos F. Moore, G. W. Dean, Henry M. Dunlap,
E. W. Burroughs, W. R. Kimzey.

Auditing Committee.

E. W. Burroughs, H. G. Easterly, H. D. Hughes,
George A. Hunt, W. R. Kimzey.

Organization of Farmers' Clubs Committee.

Chas. F. Mills, J. M. Clark, Ralph Allen.
H. D. Hughes, W. R. Kimzey.

Special Features for Improving County Institutes.

F. I. Mann, Geo. A. Hunt, Eugene Davenport,
Martin Conrad, W. R. Kimzey.

Domestic Science Committee.

Mrs. Sara Steenberg, J. H. Coolidge, J. M. Clark,
Amos F. Moore, W. R. Kimzey.

Agricultural Education and Library Committee.

Alfred Bayliss, Eugene Davenport, Ralph Allen,
F. I. Mann, W. R. Kimzey.

Soil Investigations and Experiments.

W. R. Kimzey, H. G. Easterly, Ralph Allen,
E. W. Burroughs, H. D. Hughes.

Member of the Advisory Board of the Illinois Experiment Station.

S. Noble King.

ILLINOIS FARMERS' INSTITUTE.

[CREATED BY ACT OF THE 39TH GENERAL ASSEMBLY.]

Officers, 1902-1903.

President—J. H. Coolidge	Galesburg
Vice President—H. G. Easterly	Carbondale
Treasurer—A. P. Grout	Winchester
Secretary and Superintendent of Institutes—A. B. Hostetter	Springfield

BOARD OF DIRECTORS.

Ex-Officio.

Superintendant of Public Instruction—Alfred Bayliss	Springfield
Dean of the College of Agriculture—Eugene Davenport	Urbana
President State Board of Agriculture—Martin Conrad	Sherman House, Chicago
President State Horticultural Society--Henry M. Dunlap	Savoy
President State Dairymen's Association—Joseph Newman	Elgin

ELECTIVE BY CONGRESSIONAL DISTRICTS.

1st	District—	C. P. Reynolds	4220 Calumet av., Chicago
2d	"	B. R. Pierce	562 45th st., Chicago
3d	"	Merrill K. Sweet	Glenwood
4th	"	W. Malcolm Manley	828 W. 43d st., Chicago
5th	"		
6th	"	F. C. Rossiter	91 Washington st., Chicago
7th	"	James Frake	132 LaSalle st., Chicago
8th	"	John M. Clark	71 West Monroe st., Chicago
9th	"	Jacob F. Rehm	1768 Denning Court, Chicago
10th	"	H. D. Hughes	Antioch
11th	"	Judson P. Mason	Elgin
12th	"	B. F. Wyman	Sycamore
13th	"	A. F. Moore	Polo
14th	"	E. N. Cobb	Monmouth
15th	"	J. H. Coolidge	Galesburg
16th	"	Ralph Allen	Delavan
17th	"	S. Noble King	Bloomington
18th	"	F. I. Mann	Gilman
19th	"	E. E. Chester	Champaign
20th	"	A. P. Grout	Winchester
21st	"	Edward Grimes	Raymond
22d	"	E. W. Burroughs	Edwardsville
23d	"	Fred. C. Goodnow	Salem
24th	"	Israel Mills	Clay City
22th	"	H. G. Easterly	Carbondale

STANDING COMMITTEES.

Executive Committee.

J. H. Coolidge, James Frake, F. I. Mann,
H. G. Easterly, B. F. Wyman.

State Institute Meeting.

S. Noble King. E. E. Chester, H. D. Hughes.
Joseph Newman. J. H. Coolidge.

To Select Speakers for County Institutes.

A. F. Moore, A. P. Grout, C. P. Reynolds,
J. P. Mason, J. H. Coolidge.

Legislative Committee.

E. E. Chester, Jacob Rehm, Edw. Grimes,
F. C. Goodnow, J. H. Coolidge.

Organization of Farmers' Clubs.

Eugene Davenport, F. C. Rossiter, Martin Conrad,
E. N. Cobb, J. H. Coolidge.

Special Features for Improving County Institutes.

Ralph Allen, H. M. Dunlap, W. M. Manley.
Israel Mills, J. H. Coolidge.

Domestic Science Committee.

F. C. Rossiter. A. F. Moore, B. R. Pierce,
Judson P. Mason, J. H. Coolidge.

Agricultural, Educational and Library.

Alfred Bayliss, E. E. Chester, Edw. Grimes,
J. M. Clark, J. H. Coolidge.

Soil, Investigation and Experiments.

W. R. Kimzey, H. G. Easterly, Ralph Allen,
E. W. Burroughs, H. D. Hughes.

Auditor.

S. Noble King.

AN ACT CREATING THE ILLINOIS FARMERS' INSTITUTE.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That to assist and encourage useful education among the farmers, and for developing the agricultural resources of the State, that an organization under the name and style of "Illinois Farmers Institute" is hereby created and declare a public corporation of the State.

§ 2. It shall consist of three delegates from each county of the State, elected annually at the Farmers' Institutes for said county by the members thereof.

§ 3. The affairs of the Illinois Farmers' Institute shall be managed by a board of directors, consisting of

1. State Superintendent of Public Instruction.
2. Professor of Agriculture of the University of Illinois.
3. President of the State Board of Agriculture.
4. President of the State Horticultural Society.
5. President of the State Dairyman's Association, and one member from each congressional district of the State, to be selected by the delegates from the district present at the annual meeting of this organization: *Provided,* That the members first selected from the congressional districts of even number shall serve for one year, and the members first selected from the congressional districts of odd numbers shall serve for two years, and that the members selected thereafter to fill expired terms of office shall serve for the period of two years.

§ 4. The board of directors of the Illinois Farmers' Institute shall have sole care and disposal of all funds that may be appropriated by the State to sustain the organization, and shall expend the same in such manner as in their judgment will best promote the interest in useful education among the farmers and develop the agricultural resources of the State. The Illinois Farmers' Institute shall make annual report to the Governor of its transactions, which report shall include papers pertaining to its work and addresses made at the annual meeting of the organization, and a classified statement of all money received and of all expenditures made, and twenty thousand (20,000) copies of said report shall be printed on or before September 1 of each fiscal year, one-half for the use of the Illinois Farmers'

Institute, and the remainder to the Secretary of State for distribution. It shall make no appropriation without funds in hand to meet same, and the State of Illinois shall in no event be held liable or responsible for debt, obligation or contract made by the Illinois Farmers' Institute or its board of directors.

§ 5. There shall be held annually, under the direction of the board of directors, between October 1 and March 1 following of each year, a public meeting of the delegates from county farmers' institutes and of farmers of this State, at such time and place as may be determined by the board of directors, of not less than three (3) days duration, which meeting shall be held for the purpose of developing the greater interest in the cultivation of crops, in the care and breeding of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improved highway and general farm management, through and by means of liberal discussions of these and kindred subjects, and any citizen may take part in these meetings, but only duly elected and accredited delegates from county farmers' institutes shall be permitted to vote in the election of the board of directors.

§ 6. The members of each new board of directors shall enter upon their duties the next Tuesday after their election, and hold their offices for one or two years, as provided in section 3, or until their successors are elected and enter upon their duties. It shall have power to fill vacancies in the board. It shall organize by the election of a president, vice-president, secretary, treasurer and State superintendent of farmers' institutes, and such other officers or agents as may be deemed proper for organizing and conducting the work of the organization, who shall hold their offices for one (1) year, unless removed sooner by the board, and shall perform such duties as may be required of them by rules of the board. The secretary, treasurer and superintendent may be others than members of the board.

§ 7. Rooms in the capitol building shall be assigned to the officers of this organization by the proper authority, which shall then be under the control of the board of directors.

§ 8. The board of directors may make and enforce such rules and by-laws not in conflict with the laws of the State, and will render its work most useful and efficient.

§ 9. For the purpose mentioned in the preceding sections, said board of directors may use such sum as it may deem proper and necessary, not exceeding the amount appropriated therefor by the General Assembly from the general fund for that purpose: *Provided, further*, that the

1. State Superintendent of Public Instruction,
2. Professor of Agriculture of the University of Illinois,
3. President of the State Board of Agriculture,
4. President of the State Horticultural Society,
5. President of the State Dairymen's Association,

And the present congressional representatives of the Illinois Farmers' Institute Association shall constitute the first board of directors of this organization, who shall have charge of the affairs of the same until their successors have been duly elected, and enter upon there duties as provided in this act.

As amended and approved May 11, 1901.

An act making appropriation for the Illinois Farmers' Institute and county farmers' institutes:

WHEREAS, To assist and encourage useful education among farmers and for developing the agricultural resources of the State, the Thirty-ninth General Assembly created an organization under the name and style of the Illinois Farmers' Institute, and intrusted to it the development of greater interest in the cultivation of crops, in the breeding and care of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improvement of highways and general farm management, through and by means of liberal discussions of these and kindred subjects, and for improving the condition of the farmer by affording a better knowledge of successful agriculture; therefore, to sustain the same,

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That there be, and is hereby, appropriated to the Illinois Farmers' Institute the following sums, to-wit:

§ 2. For expressage, postage, office expenses, furniture, etc., the sum of one thousand three hundred dollars ($1,300) per annum for the fiscal years, beginning July 1, 1901 and 1902.

§ 3. For the expenses of collecting matter and preparing manuscript, editing the annual report and bulletins, stenographer, clerk hire, etc., the sum of one thousand seven hundred dollars ($1,700) per annum for the fiscal years beginning July 1, 1901 and 1902.

§ 4. For the purchase of books for, and the maintenance and management of the Illinois Farmers' Institute free libraries, the sum of two thousand five hundred dollars ($2,500) per annum for the fiscal years beginning July 1, 1901 and 1902.

§ 5. For the actual expenses of district directors and of able and practical speakers to be furnished by the Illinois Farmers' Institute, to county farmers' institutes, for the purpose of assisting in making their meetings of more general interest and of greatest practical benefit, for the expense of organizing county institutes, for the expense of printing program, advertising of speakers and exhibit at the State institute, the sum of five thousand dollars ($5,000) per annum for the fiscal years beginning July 1, 1901 and 1902: *Provided*, That county institutes, or their representatives, shall be permitted to select their own speakers and to have such topics for consideration as shall be of interest to their respective localities.

§ 6. For the use of each county farmers' institute, the sum of seventy-five dollars ($75) per annum for the fiscal years beginning July 1, 1901 and 1902, to be paid to the treasurer of each county farmers' institute when such institute shall file with the secretary of the Illinois Farmers' Institute a sworn statement which shall show that said county farmers' institute has held one or more duly advertised public sessions annually, of not less than two days each, at some easily accessible location, which shall include an itemized exhibit of the expenses of said meeting, with receipted vouchers therefore, a copy of its printed program, and the printed proceedings, showing title and author of the papers read and by whom discussed, place or places of meeting, with average daily attendance, and such other information as may be called for by the Illinois Farmers' Institute and necessary to successfully assist this work.

§ 7. No officer nor officers of any county farmers' institute shall be entitled to or receive any moneyed compensation whatever for any service rendered the same.

§ 8. That on the order of the president, countersigned by the secretary of the Illinois Farmers' Institute, and approved by the Governor, the Auditor of Public Accounts shall draw his warrant on the Treasurer of the State of Illinois in favor of the treasurer of the Illinois Farmers' Institute for the sum herein appropriated: *Provided*, That each warrant on account of a county farmers' institute shall show the county institute for whose benefit the same is drawn: *Provided, further*, That the program and printed proceedings of the county farmers' institute for which each warrant is drawn shall show that some of the following topics have been presented and discussed, viz: Grain farming, stock feeding and breeding, dairy husbandry, orchard and small fruit culture, farmers' garden, domestic science and any other subjects pertaining to farm life: *Provided, further*, That if the necessary expense of a county farmers' institute shall not equal the sum of seventy five dollars ($75) as aforesaid, then said warrant shall only be drawn for the sum expended.

§ 9. It shall be the duty of the treasurer of the Illinois Farmers' Institute to pay over to the treasurer of each county farmers' institute the said sum of seventy-five dollars ($75), or so much thereof as may be received for its use and benefit, as aforesaid, and make annual report to the Governor as provided by law.

Approved May 10, 1901.

SEVENTH ANNUAL ROUND-UP MEETING

OF THE

Illinois Farmers' Institute

HELD IN THE

OPERA HOUSE
ROCKFORD, ILLINOIS

Feb. 18, 19, 20 and 21, 1902.

LOCAL ORGANIZATION FOR PROMOTING THE ILLINOIS FARMERS' INSTITUTE MEETING AT ROCKFORD, ILL., FEBRUARY 18, 19, 20, 21, 1902.

COMMITTEES.

Reception—H. H. Carpenter, J. H. King, Floyd Smith, Albert Dobson, T. G. Levings, Mrs. Foster Graham, Mrs. Thereon Pierpont, Mrs. W. L. Frisbie, Miss Jaen Kelly, Mrs. Jas. St. John, Mrs. D. W. Evans, Mrs. Martha Barkley, A. E. Hart, John Davey, Daniel Smith, Robert Simpson, D. B. Redington.

Entertainment—W. L. Frisbie, W. W. Bennett, Fred Carpenter, O. J. Kern.

Advertising and Press—Clarence Coolidge, George Tullock, C. C. Lyford, A. F. Chase.

Finance—G. W. Collins, W. L. Frisbie, William Neeley, A. J. Lovejoy.

Domestic Science and Decorations—Mrs. W. L. Frisbie, Mrs. Geo. Levings, Mrs. Robert Simpson, Mrs. John Davey, Mrs. Foster Graham.

Transportation—Hon. C. A. Works, Hon. Henry Andrus, Hon. David Hunter.

Ushers—E. M. Breckenridge, Lewis W. Manson, C. T. Main, Jesse D. Graham, Charles McCullough, Henry Farnum, Arthur Simpson, Salzer Davey, John McMichael, Hugh McMichael, R. E. Breckenridge, W. Frank Reid, C. Raymond Pickens, Peter Ralston, Sherman Parker, Parker Hurlburt, Frank Rodgers, Edward McGeachie, Samuel Fellows, George Pepper, Mitchel Smith.

HOTELS.

The Nelson, rates, $2.00 per day and upward.

Chick House, rates, $1.50 per day and upward.

National Hotel, rates, $1.25 per day and upward.

Jarvis Inn, rates, $1.00 per day and upward.

Restaurants and private boarding houses not to exceed regular rates.

ANNOUNCEMENT.

The Board of Directors of the Illinois Farmers' Institute and the officers of the Illinois Association of Domestic Science extend a cordial invitation to the members of the several County Farmers' Institutes, to the farmers, horticulturists, dairymen, live stock breeders, and gardeners of Illinois, also to the members of the Domestic Science associations and women's clubs, the housekeepers and homemakers and all others who are interested in the development of the resources of the state and the upbuilding of our homes, to attend the seventh annual State institute meeting, to be held in Rockford, Winnebago County, Ill., on Tuesday, Wednesday, Thursday and Friday, Feb. 18, 19, 20 and 21, 1902.

The meetings are free to the public and there will be an opportunity for the general discussion of all topics on the program.

Classes in corn judging, domestic science, horticulture and live stock will be conducted each morning by A. D. Shamel, officers of the Association of Domestic Science, Professors J. C. Blair and H. M. Mumford. These class exercises will afford those interested in these lines ample opportunity to inquire into questions of special value to them.

The term of office of the institute directors of the odd numbered districts expires on the 1st day of March, 1902.

The delegates in attendance at the annual meeting at Rockford will select directors for the odd numbered districts for the ensuing two years. The even numbered districts, which under the new apportionment of the State will not have an institute director residing in the district, will select directors for the ensuing year. Under the law creating the Illinois Farmers' institute "only duly accredited delegates from county farmers' institutes will be permitted to vote in the election of the board of directors."

The convention for the election of directors will be held in the opera house, Rockford, Ill., at 5:00 o'clock p. m., Wednesday, Feb. 19, 1902.

Rockford, where the State annual meeting will be held, is the county seat of Winnebago county, a city of 35,000 inhabitants, easily accessible over any of the great railroads of Illinois.

Institute visitors who are seeing Rockford for the first time will perhaps be interested to know what are its natural advantages, the character of its people, and the products by which it is known over the world. It is centrally located in the Rock river region, which drains twenty-four counties of northern Illinois and southern Wisconsin, a section of the west, which the late Governor Fairchild of Wisconsin once said would have formed a state without an equal had it been a separate commonwealth in the sisterhood of the Union. The rockbottom of the river gave early prominence to its water power and determined its destiny as a manufacturing city. It was first peopled from New England and New York. Of late years it has received a large accession from the sturdy sons of Sweden. The inventive genius of one of their earlier comers, the late John Nelson, a compatriot of John Ericcson, was the foundation of the two leading industries—furniture and hosiery.

The most important products of the Rockford factories, in addition to agricultural implements, are furniture and hosiery. The Rockford furniture embraces beautiful goods in the cabinet line, such as china closets, cabinets, buffets, sideboards, libraries, bookcases, music cabinets, combination cases, elaborate patterns of folding beds and mantels—the most beautiful designs, with high finish, clouded wood grains, elaborate carving, and handsome curved panels of bevel mirror plate, which win the eye wherever these goods are shown.

The furniture factories give employment to about 2,500 men.

The hosiery industry, which ranks next, employs nearly 2,000 people. The product of the Rockford group, the most important in the West, is sufficient to clothe the feet of 40,000,000 people.

The other prominent industries are devoted to Rockford agricultural implements, known all over the west; to glucose, corn sugars, corn oil, corn starch, dextrine, etc.; to foot power machinery, the making of mirror plate and bending of plate glass for fancy furniture; watch making, pumps and pumping machinery, pianos, milling machinery, gas stoves, hot water heating apparatus, gloves and mittens, paper, paper boxes, leather products, bent-wire goods, silver-plated goods and other specialties.

The country immediately surrounding Rockford has the finest stone roads in the west—over 70 miles of them in Rockford township. The city itself is noted for its improved streets, its liberal supply of pure artesian water, elaborate lighting system, and attractive river location.

The city has 23 miles of electric railway lines within the limits. One inter-urban line has recently gone into service. Work is either begun or well advanced on three others, and the plans are matured for a fifth.

Rockford is well provided with means of general education. It is the seat of Rockford College, an institution for young women, aiming to prepare them for lives of Christian usefulness and having no superior in literary standing between the Alleghenies and the Pacific. The city is well equipped in public schools, its high school having a strong faculty and a good equipment of apparatus. The public schools include a department for manual training.

Rockford is above all a home town. The neighborhoods of the city which have been built up by the workers in the factories have few, if any, parallels in the manufacturing cities of the west, in the evidences of comfort and home improvement.

The city is a newspaper center which supplies the tidings of local domestic and world interest to a large section of country.

Visitors of a day will find interesting points in the Rockford College, the city water works, the macadamized streets, the factories, the church buildings and the views of the city from the electric lines.

Mr. Carnegie has made Rockford a gift of $60,000 for its fine public library of 37,000 volumes.

The city is on four main transportation lines, namely, the Illinois Central, the Chicago & Northwestern, the Chicago, Milwaukee & St. Paul and the Chicago, Burlington & Quincy, which permit shipments over 30,000 miles of lines without change of management. The freight traffic of the city, principally connected with the industries, amounts to nearly 1,000 cars a week. The number of passenger trains which serve this point is 58 a day.

The people of Rockford and vicinity unite with the Institute officers in extending a hearty invitation to all to attend the State meeting. No pains will be spared to make the visit pleasant and profitable for all who may come.

PROGRAM OF THE SEVENTH ANNUAL ROUND-UP MEETING OF THE ILLINOIS FARMERS' INSTITUTE, HELD IN THE OPERA HOUSE, ROCKFORD, ILL., TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY, FEBRUARY 18, 19, 20, 21, 1902.

OPERA HOUSE—TUESDAY, FEBRUARY 18—10:00 A. M.

Music.

Prayer, Rev. R. H. Pooley, Pastor Court St. M. E. church.

Enrollment of delegates.

Appointment of committees.

Report of the condition of County Farmers' Institutes by delegates.

It is requested that reports be submitted in writing, that all delegates may have time to report.

OPERA HOUSE—TUESDAY—1:30 P. M.

WALTER R. KIMZEY, President Illinois Farmers' Institute, Chairman.

Music, "America," by the audience.

Address of welcome, Arthur E. Fisher, Rockford.

Response, Charles F. Mills, Springfield.

Report of superintendent of institutes, A. B. Hostetter, Springfield.

Music.

Short address on "Corn Culture," introducing the class work for the week, A. D. Shamel, Urbana, Instructor in College of Agriculture.

Short address on "Domestic Science," introducing the class work for the week, Mrs. H. M. Dunlap, Savoy, Vice-President Illinois Association Domestic Science.

Short address on "Horticulture," introducing the class work of the week, J. C. Blair, Professor of Horticulture, College of Agriculture, Urbana.

Short address on "Live Stock," introducing the class work for the week, H. M. Mumford, Professor of Animal Husbandry, College of Agriculture, Urbana.

OPERA HOUSE—TUESDAY EVENING—7:30 P. M.

Music.

Address, "The Farmer's Place in the Business, Social and Political World," L. H. Kerrick, Bloomington.

Music.

Address, "The Up-to-Date Farmer," Joseph Carter, Champaign.

WEDNESDAY, FEBRUARY 19—8:30 TO 9:30 A. M.

CLASS WORK.

Class in Corn Culture—in G. A. R. hall. Subject: "Corn Judging"—Silver Mine and Riley's Favorite varieties, in charge of A. D. Shamel.

Class in Domestic Science—in the ladies' ordinary, Nelson hotel. Demonstration in cooking, in charge of Mrs. H. M. Dunlap.

Class in Horticulture—in Opera House. Subject: "The Farmer's Fruit Garden," in charge of Professor J. C. Blair.

Class in Live Stock—in balcony of Opera House. Subject: "The Relation of the Breeder and Pure Bred Stock to the Farmer and Feeder," in charge of Professor H. M. Mumford.

REGULAR SESSION.

OPERA HOUSE—WEDNESDAY—9:30 A. M.

Music.

Prayer, Rev. B. E. S. Elly, Pastor First Presbyterian church.

DAIRY SESSION.

JOSEPH NEWMAN, President Illinois Dairymen's Association, Chairman.

Music.

"Class Legislation," H. C. Adams, Dairy and Food Commissioner of Wisconsin, Madison, Wis.

Music.

"How to Manage a Dairy Herd," Judson Mason, Elgin.

"Protection for the Dairy Industry," C. Y. Knight, Secretary National Dairy Union, Chicago.

OPERA HOUSE—WEDNESDAY—1:30 P. M.

MR. S. NOBLE KING, Vice-President Illinois Farmers' Institute, Chairman.

Music.

Annual address of the President of the Illinois Farmers' Institute, Walter R. Kimzey, Tamaroa.

Reports of committees for carrying out provisions of House Bill 315.

Report on Live Stock Investigation and Experiment, A. P. Grout, Winchester, President Illinois Live Stock Breeders' Association.

Committee on Corn Investigation and Experiment, F. A. Warner, Secretary Illinois Corn Breeders' Association.

Committee on Soil Investigation and Experiment, Ralph Allen, Delavan, Director Illinois Farmers' Institute, 14th district.

Music.

Committee on Horticultural Investigation and Experiment, F. D. Voris, Neoga.

Committee on Dairy Investigation and Experiment, Irwin Nowlan, Toulon, Director Illinois Dairymen's Association.

Committee on Sugar Beet Investigation and Experiment, R. S. Woodrow, Urbana, Student College of Agriculture.

Address, "The Development of a State by Legislation, such as 'Bill 315,'" Professor Eugene Davenport, Director of Experiment Station.

The delegates from the several County Farmers' Institutes will meet in the Opera House, at 5:00 p. m., to elect directors of the Illinois Farmers' Institute for the odd numbered congressional districts. and for directors to fill vacancies in the following even numbered districts, namely, the 2nd, 4th, 6th, 8th, 10th, 12th, 14th and 24th congressional districts. Only duly accredited delegates present will be allowed to vote. Voting by proxy not admissible.

OPERA HOUSE—WEDNESDAY EVENING—7:30 SHARP.

EDUCATIONAL SESSION.

HON. ALFRED BAYLISS, State Superintendent of Public Instruction, Chairman.

Music.

1. "Domestic Science in the Public Schools," Miss Sarah Hostetter, Instructor in Domestic Science, High School, Janesville, Wis.

Music.

2. Address, "Centralization of Country Schools," O. J. Kern, Superintendent of Schools, Winnebago county.
3. Discussion, led by Mr. O. E. Bradfute, Cedarville, Ohio.

ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE, AFFILIATED WITH ILLINOIS FARMERS' INSTITUTE, ORGANIZED 1898. FOURTH ANNUAL MEETING TO BE HELD IN THE LADIES' ORDINARY, NELSON HOTEL, IMMEDIATELY AFTER THE CLASS EXERCISES, FEBRUARY 20.

BUSINESS MEETING.

Report of Secretary, Mrs. S. Noble King.

Reports of committees.

Election of officers.

Reports of delegates.

Each Domestic Science club affiliated with the County Farmers' Institutes is entitled to two delegates.

The Illinois Association of Domestic Science has, in charge of Mrs. S. Noble King, of Bloomington, secretary, eighty-six volumes on "Domestic Science and Household Topics," which are intended for the Domestic Science clubs throughout the State. This is, perhaps, the most complete collection of books on these lines to be found anywhere.

For the terms upon which the use of these books can be secured, address the secretary of the association, Mrs. S. Noble King, Bloomington, Ill.

THURSDAY, FEBRUARY 20—8:30 A. M.

CLASS WORK.

Class in Corn Culture—in G. A. R. hall. Subject: "Corn Judging"—Boone County, White and Leaming varieties, in charge of A. D. Shamel.

Class in Domestic Science—in ladies' ordinary, Nelson hotel. Subject: "Home Conveniences and Their Cost," in charge of Mrs. Joseph Carter.

Class in Horticulture—in Opera House. Subject: "The Farmer's Vegetable Garden," in charge of Professor J. C. Blair.

Class in Live Stock—in balcony of Opera House. Subject: "The Steer's Pedigree," in charge of Professor H. M. Mumford.

OPERA HOUSE—THURSDAY, FEBRUARY 20—9:30 A. M.

GENERAL SESSION.

Music.

Prayer, Rev. P. M. Snyder, Pastor Second Congregational church.

Program under direction of Illinois Live Stock Breeders' Association—A. P. GROUT, President, Chairman.

"Live Stock and Fertility," Professor P. G. Holden, Pekin.

"The Up-to-Date Stock Farm," Mr. O. E. Bradfute, Cedarville, Ohio.

"Improving Our Farm Stock," Mr. Fred H. Rankin, Athens, Secretary Illinois Live Stock Breeders' Association.

OPERA HOUSE—THURSDAY—1:30 P. M.

DOMESTIC SCIENCE SESSION.

Under the direction of the Illinois Association of Domestic Science, MRS. JOSEPH CARTER, President, Chairman.

Music.

Address of welcome, Mrs. Ella G. Root, President Rockford Federation of Women's Clubs.

Response, Mrs. Emma Davenport, Urbana.

Secretary's Report of the Year, Mrs. S. Noble King, Bloomington.

"What the Household Science Department of the University Can Do for the State," Mrs. J. C. Blair, Urbana.

Report of Dedication of Household Science Department of State University, Mrs. F. M. Bills, Urbana.

Music.

"The Cost of Living and the Study of Home Economics," Mrs. Virginia C. Meredith, Professor of Home Economics, University of Minnesota.

OPERA HOUSE—THURSDAY EVENING—7:30 SHARP.

EDUCATIONAL SESSION.

O. J. KERN, County Superintendent Winnebago County, Chairman.

PART I.

Song, "Winnebago," Pupils of Districts 68, 69, 70, 71, 46, 113, 202, 107, 58.

Library Spirit in Winnebago County Schools, illustrated—

1. Illinois Pupils Reading Circle, Rea Frisbie, District 71.
2. District School Traveling Libraries, Wilford Johns, District 46.

Piana Solo, "Melaine"—C. Bohm, op. 278, Paul Schad, District 113.

School Room Decoration in Winnebago County Schools, illustrated with pictures from school room—

1. Lilian Remsburg, District 69.
2. Eunice Kingsbury, District 202.

Patriotic Exercises, by Pupils of District No. 69.

PART II—8:30 O'CLOCK.

Stereopticon Lecture, O. T. Bright, Chicago, County Superintendent Schools, Cook County.

FRIDAY, FEBRUARY 21—8:30 A. M.

CLASS WORK.

Class in Corn Culture—in G. A. R. hall. Subject: "Corn Judging"—Reid's Yellow Dent and Pride of the North varieties, in charge of A. D. Shamel.

Class in Domestic Science—in ladies' ordinary, Nelson hotel. Subject: "Value of Sunlight," in charge of Mrs. S. Noble King.

Class in Horticulture—in Opera House. Subject: "Flower and Ornamental Garden," in charge of Professor J. C. Blair.

Class in Live Stock—in balcony Opera House. Subject: "Essentials in Dairy Farm," in charge of Professor H. M. Mumford.

GENERAL SESSION.

OPERA HOUSE, FRIDAY, FEBRUARY 21—9:30 A. M.

Music.

Report of Committee on Resolutions.

HORTICULTURAL SESSION.

Under direction of the State Horticultural Society.
PRESIDENT HENRY M. DUNLAP, Chairman.

"Small Fruit," J. L. Hartwell, Dixon.

"Orchard Management," H. A. Aldrich, Neoga, Vice President State Horticultural Society.

Music.

"Marketing Fruit," H. M. Dunlap, Savoy.

"Spraying," Professor J. C. Blair, Champaign.

OPERA HOUSE—FRIDAY, FEBRUARY 21—1:30 P. M.

Music,

"Farmers' Telephones," S. S. Tanner, Minier.

"The Silo," E. N. Cobb, "Buff Jersey," Monmouth.

Open Parliament for discussion of farmers' clubs and other questions that may come before the meeting.

Closing Song, "God Be With You Till We Meet Again," by audience.

God be with you till we meet again,
By His counsels guide, uphold you,
With His sheep securely fold you,
God be with you till we meet again.

God be with you till we meet again,
'Neath His wings protecting hide you,
Daily manna still provide you,
God be with you till we meet again.

God be with you till we meet again,
When life's perils thick confound you,
Put His arms unfailing 'round you,
God be with you till we meet again.

PROCEEDINGS OF THE SEVENTH ANNUAL MEETING OF THE ILLINOIS FARMERS' INSTITUTE.

The Seventh Annual Meeting of the Illinois Farmers' Institute held at the Opera House in Rockford, Ill., was opened on the morning of February 18, 1902, at 10:00 a. m., with a piano solo, Second Minuet of Moszkowski, by Mrs. J. L. Keep.

President Kimsey: As it is customary in the commencement of all journeys and undertakings to invoke the divine blessing, the audience will please rise, and we will be led in prayer by Rev. R. H. Pooley, pastor of the Court Street church of Rockford, Ill.

Rev. Pooley: Almighty God, creator of all things; Father of all spirits, we acknowledge Thee to be the Lord. We do not think of Thee so much as a theoretical God as a practical friend, one who has led us from our earliest recollection in the journey of life. Our father's God who had guided them always, be with us in our home life and citizen life. Guide us in all personal affairs and in all national affairs. In our patriotic, spiritual and domestic duties from the inner circle to the outer circle may we feel Thy influence and aid. We return thanks to Thee for what we have which reminds us of Thy greatness today. Thou has led us out of the cities, the work of man's hand, onto the land soil, under the open heavens and amid the surrounding fertility of God's own handiwork. We ought to be more reminded than all other people of Thy constant presence, Thy greatness and nearness. Teach us that Thou art a personal God; that because Thou dost exist we exist. That because Thou are present we are directed, because of Thy personal affection and care. Oh God, we thank and bless Thee for Thy care that dost come to us upon the sun's rise every morning and stays with us until the stars died out at night. We return gratitude to Thee, the giver of every good and perfect gift. We thank Thee for our broad State. We thank Thee for its splendid organization. It has been given to our fathers only a few years fresh from the footprints of the Indian, and lo, what a wondrous development of fertility, and in developing its great measure of fertility we stand here as monuments of God's Almighty power receiving his gifts. We thank Thee for our Governor, give him strength to administer his duties. We return thanks for the sister states, for all the help we can obtain from being a part of this great Union in which we exist. We thank Thee for the president and for his cabinet and the men who make and administer the laws, for the representatives and senators. Grant, oh God, that we may be a grateful people for Thy gracious care from hour to hour and from day to day. We thank Thee for this convention, and may Thy blessing rest upon it. Let Thy blessing rest upon the officers of this meeting, guide and direct them. Be with us in each day's session, and when we go to our homes, follow us and be with us through this short life and finally gather us at last into Thy kingdom. We ask it in God's name. Amen.

President: For the committee on resolutions I appoint Mr. James Frake, Mr. C. F. Mills, Mr. J. H. Coolidge, Mr. L. N. Beal and Mr. Weatherby.

For committee on credentials: Mr. Galbraith and Directors A. W. Bryant, D. H. Shank, H. D. Hughes and H. G. Easterly.

President: The secretary will now call the roll of counties and we will have the reports of delegates. When your county is called, please rise and make your report.

Adams County—

Mr. Black: It has been a kind of unwritten law that two institutes should be held in our county. I believe no county held an institute larger than the one in Adams county in October of last year, and our next, the 29th, will be held next Friday and Saturday on the last of February and 1st of March. We hold our institutes with the association of domestic science, and we don't try to advertise it at all. We don't find any need for it, it is hard to get room. We have wide awake women, wide awake men and wide awake boys and girls, and while we don't think we have the best institute in the State, we believe we are doing some good and we are sure we never had the interest we have today. Our institute work is doing good in Adams county. I don't think it is right for me to make a long speech.

Delegate: Tell them about the method of holding the institute.

We have it on wheels. We hold it all around the county. It depends a good deal upon the situation of the county and its towns. If they are without a large hall they can not hold a good institute, and I think this is the reason of the failure of the institutes in some counties. But we go to the people, if they can't come to us we go to them.

Boone County—

Mr. Walter Lucas: We held our seventh annual institute on January 28, 29 and 30 last, and I am pleased to report that it was the most interesting and successful institute we have held. The attendance the first day was good, much better than we expected, as it was very cold. A year ago there was a Domestic Science association organized in connection with our institute, and they had charge of the second day, which proved to be the crowning day in point of enthusiasm, entertainment and attendance. Free coffee and lunch was served at noon hour which added much to the interest in a social way. The attendance and interest continued good to the close of the session. We had on our program good speakers from home and abroad, and the program was carried out to the letter, every speaker responded to the call.

Bureau County—

Mr. F. J. Nye: We didn't have any special features. We had an excellent program. The Domestic Science had the first afternoon and the next day, the second, was farm topics. The morning hour was in all cases poorly attended. In the afternoons we had a splendid attendance, probably not less than 1,000 a day, and the last day much more than that. The only special feature was offering premiums for essays. The essays were good, but they seemed to have the ear marks of teacher rather than pupils. There is a question in my mind whether it is very beneficial or not.

Carroll County—

Mr. Charles Spots: I am glad to say that we have a lot of farmers in Carroll county, both old and young. I am glad to say the young men are not smart Alecks. I am very glad to say that a number are jewels to the county and they want to obtain good common sense—farm sense.

We had an institute at Shannon, Ill. Our house accommodations were not sufficient to accommodate the crowd that were interested in the Farmer's Institute of our county. Evidently the interest of the Farmer's Institute is on the increase in our county. We turned away at least one half of the people that came to listen to the proceedings of the meetings, and I am very sorry to say some speakers who came a little late found the doors locked, and I hope when they come again they will be able to be present on time.

Champaign County—

E. E. Chester: Champaign county held a very profitable institute this year. The difficulty some gentlemen have spoken of in getting a room large enough to hold our institute has been avoided by holding two. We aim to hold two institutes in each year. The first was held in January at the University of Illinois in Morrow hall. The name Morrow hall seems to add interest to the meetings, but the crowning effort was held in Mahomet, a little town 12 miles away, but they have a large hall and we had an enthusiastic program. So you see Champaign as the oldest institute county is yet enthusiastic. One need not fear enthusiasm will die out if the proper notice is given to the people and the proper program is furnished them.

Christian County—

Mr. Harry Grundy: Mr. President, as I see the secretary is not here to report, and as a member of the executive board and a delegate I would say that Christian county held her 16th annual institute at Stonington in October, 1901. The executive committee have adopted the policy of holding the institutes in different parts of the county. In the contest, among the different sections of the county for the institute everybody becomes interested. The result is a large attendance and plenty of enthusiasm. An exhibit of agricultural products was held at Stonington in connection with the institute which aroused a lively competition and contributed largely to its success. On the whole the interest in the institute is evidently increasing and its effect on the agricultural, horticultural and social interests of the county is felt to be very great.

Cook County—

President: Is there any farming in Cook county?

Mr. Frake: We have a little, but a good deal of something else.

Mr. President and members of the Illinois Farmers' Institute: The Cook County Farmers' Institute was held at Chicago Heights January 31 and February 1, 1902.

The two institutes previously held in this county were held in the northern part of the county, more than 40 miles distant, the last one being held three years ago.

Chicago Heights is in the extreme southern part of the county. It is surrounded by a large farming district, devoted principally to stock raising and feeding, and to dairying. But few of the farmers in the southern part of the county knew what a farmers' institute meant and had never attended one. The program was one of the best. On it were many of the institute speakers in the State. All who attended were not only interested and instructed but well pleased.

Hon. L. H. Kerrick of Bloomington told the institute in a way as no one could tell but him, how he raised, fed and cared for his cattle. Prof. O. T. Bright, county superintendent of Cook county schools, who followed him in an address on the "Schools and Farmers," said, by his having heard Mr. Kerrick's address, he was a more capable man; that he could better instruct the teachers of Cook county how to teach, care for and manage the children intrusted to their care.

One gratifying feature of the institute was the large number of farmers' sons who attended. They and others at the close flocked around the officers, soliciting them to hold another institute there soon, saying they would get the "whole country to attend next time."

The farmers in the northwestern part of the county are engaged principally in dairying, and thus the fertility of the farms is well provided for.

The farming lands immediately adjoining the city are devoted to raising vegetables for the Chicago markets. These vegetable farms or gardens vary very much in size, from a few lots to many hundreds of acres. The largest one comprises about 700 acres within the extended city limits of Chicago on the north side, carried on by Mr. L. A. Budlong, who at times employs as many as 2,000 weeders, paying them their wages every evening. Mr. Budlong, who has been engaged in this business for over 40 years, read before the institute an exceedingly interesting and instructive paper on "Vegetable Raising."

In answer to that part of the resolution adopted at the last meeting of the directors of the Illinois Farmers' Institute that the directors report "the best methods to be adopted by county institutes for aiding in the promotion of agriculture in the several counties" would say, that those having charge of the program should be persons who know where the best and most up-to-date agricultural methods are pursued, and there procure the very best obtainable talent to *instruct* the members of the institute. Never select a person to address an institute simply because he can talk; he should be able to instruct. The prairie zephyrs usually furnish us with wind enough.

The Cook County Farmers' Institute at its recent meeting meeting adopted a new constitution applicable to the nine new congressional districts. Hereafter we expect to have much better institute work done in Cook county.

Crawford County—

J. B. Trimble: We have been holding institutes for about five years and we have two domestic science associations in our county, and we take advantage of them and put them on the first day in order to get the attendance. Everybody comes out to hear them. Mrs. Dunlap said the first time she talked to about 40 women's husbands and three girls. That was the audience the first time, and this last time we had a house full of women and men. Our institutes have not been crowded, but we are in the backwoods a little. We hope to do better in the future than we have done.

DeKalb County—

Mr. E. C. West: I think our secretary has the report but I do not think he is here.

Our institutes was organized some four years ago. I had the honor of being the first president and the institute has been growing ever since it started. Of course it was a new thing at that time. One of the best features is our exhibit. We had an exhibit two years ago and this exhibit is gotten up by a committee who visit each business house in the city of Sycamore and get some kind of exhibit donated, all the way from corn shellers to hams. We don't object to anything and consequently we got some $300 or $500 worth of exhibits and it makes the business part of the town interested in our institute. We had a corn exhibit, grain and so on and every article had something attached as a premium, consequently we got a large exhibit of corn and the corn has improved probably 25 per cent in the two years under the influence of the corn exhibit and our corn crop has increased at least 25 per cent. It is difficult to find a place to hold it. We had it at Sycamore three years and went to Hinkley last year and had a very large crowd. They did not have a hall big enough. We have a large evening entertainment and hold three meetings a day. On an average the last year the attendance was a little over 700. Our evening entertainments are quite largely literary, given by the young people.

DeWitt County—

Mr. E. L. Hoffman: I have no written report but can make an oral one unless you think I had better write it. We held an institute at Clinton, the county seat, on the 21st, 22d and 23d days of January. Our attendance was good. The fact is the institute has grown so we can no longer accommodate the people, I am sorry to say that that interest which I presume is the original and primary design of the institute—to gather in the young men who farm, has not been very successful with us. We have a good many "smart aleck" fellows who have come to the conclusion, somehow or other, that they know more than the older men. We are slowly gathering them in, and the fruits from the institute are very visible. Those farmers that have availed themselves of the institutes, it is not a hard matter to pick them out when riding over the country.

Edgar County—

George H. Gordon: At the last moment I learn that our county will have no delegate. I am sorry that this is to be true. I send short statement by our esteemed and efficient director, Mr. Shank, telling you that Edgar county is still in line with farmers' institute work. Our institue this year was held in Paris on Jan. 16 and 17. We had an excellent program and a very large attendance. The intesest in this work is growing in our county. The Domestic Science association was given one afternoon and evening for their program. I am glad to say that their session was one of the most interesting and entertaining features of our institute. By all means encourage this part of the work. We need more young farmers to take hold of this work. They are more easily convinced of the change that is now taking place in agriculture pursuits. They are more willing to try new methods as presented at our institutes. They are ready to reject the old and accept the new and improved methods of farming. The interest increases in the institutes held in our county. I then report progress in Edgar county and hope it may continue as the years roll by.

Edwards County—

W. E. Shurtleff: Our little county of Edwards has been trying to keep in sympathy with the institute work and in line with the rest of the counties of the State. We have been holding institutes each year for about seven years. It is the effort of the officers to make each institute a little better than the previous one. And I believe they have been successful. This year we held a three days session. Two days of this meeting was devoted to agricultural topics. We had Mr. Otwell of Macoupin county with us. We were also assisted in this institute by our county superintendent of schools and one half day and an evening session was devoted to education and was conducted by the superintendent and teachers of the county.

We also have an auxillary organized, and the ladies of the Domestic Science association were allowed one half day of this meeting and the time was profitably spent.

Franklin County—

J. M. Vancil: Our institute last year was virtually a failure. We elected officers, a president and vice president who were so busily engaged in picking apples they did not have time to attend to the institute. We went to work and went through the form of having an institute, however. Our people have not taken to institutes, but they are getting better and we now have the influence of the merchants and leading men and you may expect next year to hear a favorable report from Franklin county.

Ford County—

F. A. Warner: The Ford County Farmer's Institute opened auspiciously on program time in Buchholz hall. The decoration committee had done their work well. Farmers always acknowledge the "corn" so the "Welcome to Ford County Farmers" that framed the platform was very prettily and effectively done in pieces of ear corn picked out with husk, daisies and festoons of timothy heads. And just so effective were the bunches of cornstalks in the corners; more would have spoiled the effect. The committee were wise in their choosing. Mr. John Iehl presided. His president's address was short, only a pleasant talk, with reference to the good effect of farmer's organizations; giving gracious welcome to those present and prophecying full attendance for future sessions.

The sessions of the institute were well attended. The hall's capacity was tested by 450 people finding places in auditorium, hallway and wings of stage; standing room was not to be had at any price, and many went away after trying in vain for entrance. The evening sessions of amusement were as well attended. Miss McClure received much praise for her forceful, truthful statement of home life on the farm, with the unlovely truth of big barn and small house; she gave the further truth of how the comfortable farm home might be had. The inference was that if farm wives cared for themselves as punctiliously as they helped the farmer care for the stock they would be as carefully cared for. Miss McClure thoroughly understands all phases of work on the farm and knows just what a woman can and can not do.

V. G. Way made short cut to the farmer's common sense. While clover seeding has been talked many times from many platforms without much effect, practical farmers easily saw the practical wisdom of these remarks. The talk on horses and poultry was well illustrated with spirited pictures.

F. A. Warner of Sibley was listened to with marked interest. His figures and statements were easily understood, and the Sibley farms are proof positive that his propositions for better corn are practical.

The talk "On Corn Judging," by J. D. Funk of Bloomington, was a lesson lecture, easily comprehended and thoroughly appreciated. While the Sibley estate puts the cost of corn raising 23 cents per bushel, and our farmers say 23½, Mr. E. J. Taylor of Chrisman created a sensation by stating that corn could be raised at a cost of 7 cents per bushel. Taking into consideration the difference in price of land and labor, there is still room for Mr. Taylor to have taken the position of all men with new ideas, a position much beyond that to be occupied by their followers. Considered as a whole the institute was a success. The discussions centered very largely upon better seed and better seed bed and more thorough cultivation.

There were evening entertainments for the 22d and 23d furnished by the Melvin people and which were ably conducted and very largely attended.

There was an exhibit room across the street which, though small, was sufficient for the very moderate exhibit presented. The crop of 1901 corn was much below the average in quality and hence farmers did not care to exhibit largely of a poor crop. The exhibits presented shows careful selection. The exhibit in the ladies' department was very good. All exhibits of fancy work were new. The exhibit of bread was exceptionally fine, especially that of the young girls. We are glad to see the young girls aiming at usefulness and industry. The exhibit of needle work and darning showed work well done. The exhibit of butter was excellent. The pineapple or cone was admired by all and showed great taste and skill of its making. It is said "the way to reach a man's heart is through his stomach," and it seems quite probable. By observation in the exhibit hall we could not help but notice while the gentlemen seemed most attracted by the articles palatable the ladies seemed to be most fascinated by the articles most beautiful to the eye.

The next session of the Ford County Institute will be held in Roberts, January, 1903. The principal officers are: President, John Smith; secretary, R. B. Chambers; assistant secretary, A. P. Baylor, all of Roberts, and treasurer, D. A. Taylor of Gibson.

Fulton County—

Mr. ——————: The annual meeting of the Fulton County Farmers' Institute was held at Ipava Nov. 7 and 8, 1901. A fall meeting was an experiment with us, such date being deemed best, as an exhibit was desired. The exhibit was made possible through the generosity of the Ipava merchants, and though it was not as large as a more favorable season would have produced, it was a feature of much interest of our institute. Beside local talent we had with us the grand old veteran, Henry Wallace, A. P. Grout, Fred Rankin, A. W. Stevenson and others. Ipava was a new field for our labors, an institute never having been held there before, but the townspeople and local farmers gave us most loyal support so that the most interesting meeting of our history was held.

Fayette County—

Richard Wittle: We held an institute on the 16th of January and had a good program, but the attendance was very disappointing. We had some of the best speakers. We are determined next year to have a better one than we have ever had.

Hamilton County—

John P. Steele: Our institute was organized before the institute law was adopted and we have held four institutes a year in the county since that; a quarterly institute and then the annual institute. The quarterly institutes are held generally at some point in the county outside the county seat, and the annual ones are held in the county seat, and we have very successful institutes. I think the institute work in the county may be said to be doing very well. We are making arrangements for our next annual institute and hope to have one of the best the county has ever had, and have appointed a committee of three for each township whose duty it is to work up the interest. We are also arranging for the township institutes and will provide a banner to go to the township that makes the best general exhibits of the products, and that banner we expect to be passed along from one year to another by the different townships. That is a general outline of the work in Hamilton county.

Hancock County—

S. F. Rank: We held two institutes. We had a very successful institute at Adrian, and at the institute that was held at the county seat they said there was nobody there.

Delegate: I was there at both; the county institute was a fairly good institute.

Henry County—

W. W. Cole: I have the honor of being a delegate without credentials, but from a county that takes a great interest in farmers' institutes. We held one at Cambridge in December and one later in Galva, and one at Woodhull, and the halls were not sufficient to accommodate the people. I know, as I had to stand up myself.

In our county we have come to a period when the farmers are ceasing to laugh at what we call book farming. We are learning now in all parts of farm work as in cattle feeding, we need a balance ration, and the day has come when we have to use something besides our muscle on the farm. It requires brain. And the question of the farmer is not how to obtain wonderful muscle but how to make practical farmers and by the use of our agricutural college and experiment stations we are not obliged to grow old before we learn the right way to do a thing. It is hard to get used to this hothouse plan of farming when we have been used to feeding our cattle and taking the weather as it comes, but all over the work of the agricultural colleges of Illinois, Iowa and Kansas is becoming as familiar to the farmers of Illinois as the district schools. In Henry county we are organized along the lines of practical farming. We already have a nucleus for the carrying on of our work in our appropriation by the legislature, but as you know $2,500 was cut out of our appropriation bill during the last House in which I had the honor to serve. The day has come, with land worth $100 an acre, we must farm less and farm better and we will have a great deal more money and better homes. We will be able to keep our boys and girls on the farm where they can make better citizens than they can by going to our cities to starve to death.

Iroquois County—

David Brumbach: In Iroquois county we held our 16th annual meeting at Watseka Jan. 15-16, 1902, and elected officers for the ensuing year. Besides the usual number of addresses by persons of note from abroad and at home upon various farm topics, with music and recitations interspersed to break the monotony and enliven the sessions for all.

The institute has by its teachings and influence been the means largely in bringing the city and county together in realizing that their interests are one, and that there is still a vast field ahead for further progress in agriculture through learning.

Our people are interested in holding in connection with the institute, an exhibit of farm products and samples of home skill from the brain and hand of woman, with premium awards, to which the citizens of Watseka and surrounding country were liberal contributors to the amount of $175. A new feature was added this year by giving premiums for the best four essays on "A Modern Farm, and How to Farm it," by boys under 16 years of age. This proved a success in creating an interest in the young and older people also. Such inducements should be increased and extended to girls as well on topics pertaining to the home. As the years have passed each institute meeting has added new interest in the people to the work being done, and today they sing their loyalty to both "Illinois, Illinois," and "Iroquois, Iroquois."

Jo Daviess County—

Mr. Russell: You will have to excuse me a little as I didn't know exactly what you expected of me, and perhaps my report will be a little round about. We elected our secretary and president a year ago, and our secretary sent in his resignation along about March, and fortunately when I was in Galena I met Brother Dallyn and he said you have got the work to do and do it alone. I saw the situation and went to work, and they told me it was a grand success, and I was congratulated a good many times. We had the very cream of Illinois, Wisconsin and Iowa to help us; such men as Shamel, Mrs. Armstrong, Wallace from Iowa,? Van Meter from Wisconsin, and it is no wonder we succeeded; we couldn't do otherwise. We had to succeed. It all went right along. They told us we would have to hold it over again the same next year.

Johnson County—

W. J. Casper: I have the honor to report in this meeting that the products of our county are red apples and politicians. I might also add as another product, hoop poles. It is one of the most southerly counties in the State. We held our third annual institute on the 13th and 14th of last November. I believe I was the first president and the second and the last, and I wish to say that it has been a one-sided business, but I take pleasure in saying we had a good institute this fall, and I believe the next one will be better. We are located in the extreme northeast corner of the county, and have but one town of any size and the county seat, and that is where they grow the politicians. We have been holding the institute at New Burnside, and they want it down at Vienna, and I sent them word if they wanted it down there they would have to vote it down there, and we propose to keep her as long as we can. I have made no written report of our proceedings. My experience in state institutes and county institutes I have attended has been too much program. We are always behind and never get through. In making up our program this year we made a very short one, but I want to say we had all the program we needed to take up five sessions, and took it all up and stayed until dark, and had scarcely time to eat.

Jefferson County—

S. T. Maxey: Mr. Chairman—I want to say we held our last institute on the 15th, 16th and 17th of November last. We held our first institute nine years ago this coming March. Jefferson county is the balanced ration in institute work. It is the very hub of Egypt and the land of Goshen and Cairo, while the valley of the Nile flows down through the center. Our fathers came and cast their bread upon the waters before there was any State of Illinois, and they have been gathering it ever since. I understood the Rockford gentleman to say the man who caused Rockford mayor's so much trouble used to preach in Tamoroa. I preached there for two years to President Kimzey's father's and mother's family. I quit preaching and went to farming, and I have been farming ever since.

Q. Are you the preacher?

A. I was on the other side of Central Illinois when it happened. The Central Illinois railroad you understand.

Laying all jests aside. I am in Brother Beal's district. He is my neighbor. We have good institutes in Jefferson county. You know that. While we have not the interest I would like to report, I am glad to say we are growing a little. Our ladies are now organized in domestic science and that has been a success, and as the old darkey said about the sons of his race, he says "We are getting bettah, we are getting bettah."

Our institute was held at Mt. Vernon. We had an excellent program consisting of papers on "Stock Breeding" and "Corn Breeding," with a number of other topics among which were papers on the "Beautifying of the Farm Home" and "Home Culture."

Some of our speakers from a distance could not be with us on account of previous engagements. Yet the time was well filled by home talent. The discussion of the topics showed a lively interest by all. The afternoon of the second day was occupied by the ladies of the Domestic Science, who with a well arranged program held a good large audience until a late hour. The third day was of an educational nature conducted by our county superintendent of schools and teachers. The nature of this day's program was of such that it drew a large audience of children as well as patrons. Considering the drouth through our country we had a grand display of fruit and farm products.

The farmers have been slow to take hold of these meetings, but each year we see a greater interest manifested and an evidence that the farmer is awakening to the opportunities before him, and realizing the need of being in closer touch with the world in general, has caused him to seek for and obtain rural free delivery of mail throughout the county, and more yet the system of telephones threading all parts of the county connecting farm house with farm house. Thus as a reward we see the farmers fast coming to the front. Feeling that our institute has been conducive to this advancement we look forward with fond anticipation to the future.

Lake County—

H. D. Hughes: I want to report that I believe Lake county is waking up to the situation, at least a part of her is. One gentleman spoke this morning about the prize essays that they had had in their institute. We also had them and I think they were one of the best features. Some of them of course, were better than others. They were confined to young people under 21, and would expect them to be theoretical, but we had one from a little butter maker that was as good as any I ever heard from any platform in that line and I want to say that I think it is a good thing to encourage the prize essay scheme amongst the young people. It sets their thoughts in motion. In fact they have many thoughts they never would have if they did not have this chance to express them in public. One thing that we have tried to do was to bring the agricultural college and the farmer closer together. Whereas two years ago we had no college students in that college now we have seven or eight, and if we have done nothing else in institute work except to get those young men down to the Agricultural College of Illinois, we would feel we had done enough and I think that is one thing that the institute wants to do is to bring the agricultural college and the farm closer together. Our institutes are growing in interest in the county and the local farmers are getting interested.

Lee County—

Mr. Hartwell: A most interesting and instructive farmers' institute was held in the village of Paw Paw, Lee county, Jan. 28, 29, 1902, President Hartwell of Dixon, presiding.

The opera house was packed during all its sessions with farmers and their wives, interested spectators and participants in the many economic and agricultural topics discussed.

Interesting essays were read defining a proper arrangement and maintenance of farm or rural homes, making it inviting and pleasant for the farm boys and girls, causing them to be less desirous to leave their homes and acquaintances and congregate in our cities among strangers and temptations. Essays on butter making were read and discussed. In fact all subjects pertaining to the best way of caring for the farm in tillage and appointment, the kind of stock and its care, were fully discussed. Prof. C. G. Hopkins of the State University at Champaign gave an interesting talk, explained by charts and chemicals, on "Plant Growth."

Mr. Walkup of Oregon spoke on the subject "To What Extent Should Farmers Raise Horses?" The attendants at these meetings were so well pleased with the apparent benefits derived that they unanimously voted to have it held at Paw Paw next year.

Livingston County--

Mr. ————: The annual Livingston County Farmers' Institute was held in the court house at Pontiac on Wednesday and Thursday, Jan. 15 and 16, 1902. The weather was fine and the average attendance at the sessions was more than 600. The program as arranged was carried out in full, except as to the absence of some of the speakers on a general discussion of corn culture. This subject was to have been discussed by ten different farmers of the county, but only six of them were present.

Special features were the reading of essays by farmers' boys on "Farming as a Business Vocation," and by farmers' girls on "The Advantages and Opportunities of Farmers' Daughters." Suitable recitations were also given by young people from various parts of the county, the prize essayists and reciters, ten in number, coming from ten different townships in the county. Excellent music was furnished by pupils of the city schools of Pontiac and the Pontiac township high school.

Prof. Hopkins of Champaign, O. T. Bright, superintendent of Cook county schools, Mrs. H. M. Dunlap of Savoy, C. E. DeButts, superintendent of the schools of Fairbury, and Mrs. Jennie C. Barlow of Bloomington gave excellent addresses.

One of the results of Mrs. Dunlap's presence was the organization of a Domestic Science club for the county with Mrs. O. P. Wagner of Pontiac as president and Mrs. W. S. Perry of Forrest as secretary.

In connection with the institute, prizes were offered on poultry, potatoes, butter, seeds, fruit, etc., and a very creditable exhibit was made. In the poultry exhibit more than 200 fine birds were shown. The exhibit attracted much attention, and the large room in which the exhibits were shown was crowded practically all of the time. The expenses of the institute, including the premiums given, were nearly $250.

Mercer County—

J. C. Holt: I have a short report made out, and I might say that our president who is here, Mr. Rhodes, is so enthusiastic over the Farmers' Institute that we are sure it will be a great success. I was told the other day of a farmer who was going crazy over the Farmers' Institute. I think we need a few fanatics to wake the people up. December 11, 12 and 13 we held a meeting at the court house and we have heard a great deal about the Farmers' Institute since the last meeting, therefore we are very hopeful of results in the near future.

Moultrie County—

Mr. J. C. Hoke: Moultrie county has held three annual meetings, and while the attendance has not increased materially, those who do attend take greater interest in the meetings and are spreading the good news to others. We are hopeful for better results in the near future.

McLean County—

Mr. King: I believe the regular delegate from McLean county is not present, and I don't want the people of this institute to think that we don't have any institute in our county. We have had two different ones, one at Bloomington and one at Lexington—the most interesting and best attended of any institute we have ever had. One of the features of our institutes was the Domestic Science association, and we have a Domestic Science department to the Farmers' Institute. We have adopted a differ-

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ent plan in our institutes from any I have heard of throughout the State, that is that the exhibits of grain or farm products are donated to the association and then sold—put up at auction in the last half session. The Domestic Science has entire control of the pantry stores. We derive a revenue in this way for the carrying on of our institute. At first some parties thought we shouldn't ask parties who had entered articles for premiums to donate any thing more than what took premiums, but there is more or less expense with the carrying on of our institutes, and as it is a Farmers Institute there is no reason why the farmer shouldn't help bear the expense, and that is about the easiest way I know of for them to do it. There was a feeling for a while that the people wouldn't bring things, but the fact is they are becoming more interested. For the premium offered for the best loaf of white wheat bread there were 17 entries. It was open to all the ladies of the county and the first premium was taken by a 15 year-old girl.

Mr————: How much was the premium?

A. A sack of flour offered by one of our merchants. We don't have to ask the merchants in Bloomington to donate. All the different branches of trade volunteers, from sulky plows to windmills, set of harness and everything that pertains to a farmer's life. We have this winter for the first time held a second institute. We held it at Lexington, just north of Bloomington. The State Farmers' Institute didn't have anything to do with getting it up, and it was second to no county institute in this State, I am safe in saying, in attendance in numbers at least, and in good papers, and one of its features was the general discussion by the farmers of the neighborhood, and I think that is one of the things that makes your institute a success—the exchange of opinions. But on the ladies, afternoon we had the largest attendance, nearly 2,000 it was estimated. We have the younger portion of the community at our meetings, and there is no question in my mind but what in our county, and in every county, that is one of the best features of the institute, to get the young people in.

Macon County—

C. A. Thrift: We held our annual institute the 21st, 22nd—23rd of January, and as Mr. King says, we had an exhibition with it, and the exhibit is donated to the institute and is sold on the last day. We have been doing this for the last five or six years. We offer premiums in all lines of merchandise, and the proceeds of all this pay the expenses. We have a large meeting, as we have always had a rate of one fare and a third on all railroads within fifty miles of Decatur, and with that fare we have a large increase in numbers in attendance and the institute has always been a success and is growing every year.

Marion County—

Mr. Schmerhorn: Our attendance has increased about four fold in the last three years. We have more people than we can get into our court house. We had $265 in premiums for stock and fancy work, for bread, dairy products and such things, and there is a livelier interest taken by the younger classes, and the Domestic Science is doing a grand work.

Mr. King, McLean County: I believe I mentioned that these entries were all sold at public auction and the man who took the first prize on the best fifty ears of yellow corn sold $300 worth of seed corn while our institute was in session.

Mernard County—

Will H. Young: We held our sixth annual meeting in the middle of January, and our circuit court room, which seats about 600, was packed to the walls and ceilings, and we had an overflow meeting in the grand jury room, and Mr. Winters talked corn in the grand jury room. The county superintendent of schools is with us in our work there, and he had the country schools in that county dismissed for the one day of the institute, and there were 29 school teachers reported there and stayed all day with the scholars that day. Mr. Carter was there and talked to them. The first day his morning talk was on "Clover," and I would just like to have had you heard him, and in the afternoon the subject was "The Best Crop on the Farm," and that was farmer's boys.

For several years we have had a general exhibit, but it was too big a thing for us; we didn't have a place to put it, and this last year we limited it to corn and butter. We had Mr. Winter to do the corn scoring and he scored it right before the audience. Mrs. Springer gave a talk on butter and scored the butter. She represents a butter association in our county.

Montgomery County—

Mr. Grimes: I am not one of the delegates; the three are present in the hall, but a few days ago they requested me to make a report at this time.

The annual Farmers' Institute of Montogomery county was held in Raymond, October 22, 23 and 24, with evening sessions on the first and second days, and I am pleased to report that never in the history of Montgomery county institutes have we held a more successful or more profitable meeting than this, the sixth annual institute.

The meetings had been advertised by placing copies of the program in the schools of the county about two weeks before the time of holding them, therefore nearly every family received one or more copies, especially in the north part of the county. The result was a very large attendence from the opening until the close, standing room being at a premium at many sessions.

The average daily attendance reached 2,500.

One pleasing feature was a large number of young men and women in attendance at nearly every session, showing a keen desire to learn and to assist in the good work.

It has been the earnest desire of the officers to arrange a program on all topics of general interest to the farmers of this county, but some topics being of more importance than others, more time has been given to their discussion. Therefore great encouragement has been given to corn growing, always furnishing good talent on this subject. Grazing and feeding cattle for profit is a very important matter with farmers in this county, and is made a special feature at one session at least. The swine industry has been kept to the front in all our meetings, believing that the porker is one of the helps to lift the mortgage. The sheep industry has not been lost sight of as we realize that the sheep is oft-times the mortgage lifter and that mutton is becoming more popular with the consumer of meat every day.

Neither are we behind in the matter of farm telephones. Our Farmers Institutes have always given good encouragement to this enterprise, and but few counties in the state can boast of more farm telephones than this county of Montgomery.

The officers at all times encourage free mail delivery, and last, but not least, encourage township organization believing that the best results can be obtained mainly by getting the best talent and best workers in each township interested, and through their efforts build up good county institutes, not depending so largely on speakers from a distance

McHenry County—

J. H. Turner: We had four days of institute, two at Hebron and two at Nunda, so as to divide the work and give the farmers a better chance to attend. We had Professor Henry————, and George Carroll and Cook of New York and President Kimzey and many other good speakers. The McHenry county farmers are fast learning of the advantages and opportunities offered the farmers in these institutes, and are taking advantage of them. I do not think it best for me to take any more time.

Macoupin County—

C. H. C. Anderson: When it was my pleasure two years ago at Mt. Vernon to offer you the report of the Macoupin County Farmer's Institute an era of prosperity for our institute was just dawning. Since that time it has made such rapid progress that it now stands as one of the foremost institutes of the State and its meetings in point of attendance and interest manifested by the farmers of the county are second to none in Illinois. During the last meeting, which was held in the large circuit court room of our $2,000,000 court house standing room was at a premium.

The rapid progress of our institute during the last two years has been largely due to the establishment of a corn contest for the farmer boys of Macoupin county, by our president, W. B. Otwell. This gentleman was elected secretary of our institute when it was first organized and took such an active interest in its work and making it a success that he was the unanimous choice for its president three years ago. In the capacity of president he has spared no effort to bring our institute to the highest plane and it was this spirit of attempting everything for the best interests of Macoupin county farmers that caused the idea of a corn contest for boys to be evolved in his mind.

Early in the year 1900 President Otwell announced his intention of holding a corn contest for boys under 18 years of age, made a personal offer of $10 in cash for premiums and asked that a few others duplicate the amount, which three public spirited citizens of Carlinville quickly did. This total of $40 was divided into 40 premiums of $1 to be given for the best 40 collections of ten ears each. The president then secured a number of varieties of corn and appointed a committee consisting of some of the older and more successful farmers of the county to select the variety they considered best adapted to the conditions of our county. A variety of yellow corn was selected. This having been done Mr. Otwell, at his own expense, purchased enough of this corn to send a package of several hundred grains to every boy sending in his name. The contest attracted a great deal of attention throughout the county, with the result that we had a good display of corn and the largest attendance we had ever had at our institute.

The past year President Otwell secured a grand lot of premiums including a windmill and many farming implements. A variety of white corn was selected for seed and a package of corn sent to every boy under 30 sending his name, and 5 cents to cover postage. Although the season was very unfavorable for corn we had a most magnificent exhibit in connection with our institute last November. The corn was judged by Professor Shamel of the State University and he stated that our corn display compared favorably with such large exhibits as the one at the last Illinois State Fair.

The seed for the contest this year has not been selected. The premiums, of which there is a long list and which will probably be offered to boys under 25, consist almost entirely of live stock given by the farmers and stock raisers of Macoupin county alone. In addition to the corn contest this year there will be a home-made light bread contest for Macoupin county farmers' daughters and a butter contest open to the wives and daughters of Macoupin county farmers.

The Macoupin county farmer boys' corn contest has attracted widespread attention throughout the State, a number of counties starting similar contests, and our president, Mr. Otwell, is now quite well known to a great many of you.

An unselfish effort to benefit others is always rewarded and the St. Louis World's Fair Commissioners for Illinois, realizing the ability and energy of our county president, made him their unanimous choice for the position of superintendent, of the Illinois agricultural exhibit at the great world's fair to be held in the near future, and before it closes you will doubtless hear more concerning the progressive president of the Macoupin County Farmers' Institute. I thank you.

Ogle County—

Chas. T. King: Our secretary who was to make a report is not present, but I want to say that we had a Farmers' Institute, and I think it was the 13th or 14th, held in Ogle county. I was there at its first organization and I don't like to see the reading of the name of Ogle county passed over without a report. We had a very large and enthusiastic meeting in Mount Morris the 30th and 31st of January. I think there were more turned away than could get into the hall. So you see the people are becoming enthusiastic in Ogle county over the Farmers' Institute. I didn't expect to make any report. Mr. Walkup, the secretary, is not here and we had depended upon him to make the report and therefore I have nothing in mind only to say we had one of the most enthusiastic meetings in Ogle county we have ever held.

Piatt County—

Clarence Adkins: I had depended upon the president to make this report, but found out he wouldn't be here. The annual meeting was held at Monticello, Ill., Jan. 30 and 31, 1902.

The institute closed with the feeling that for practical presentations and interest the sessions were eminently successful. The attendance of farmers was only fair. Many more should have been there.

Putnam County—

J. H. Williams: Putnam county's institute was held at Granville on Dec. 18 and 19. A good program was arranged by the executive committee which was responded to by nearly all having topics assigned them, including Prof. A. D. Shamel, Ralph Allen, Mrs. Joseph Carter and others. The evening program of the 18th was of a literary nature, consisting of recitations, interesting papers and fine music by home talent. The institute was held in the spacious rooms of the Congregational church, where there was ample provision made by providing conveniences for exhibits from the farm, garden and kitchen, all of which were well represented. The meeting was a decided success and well attended considering the weather, which was below zero all the time; daily attendance was about 200.

Rock Island County—

Mr. Sprague: I regret to have to say Rock Island has not held a Farmers' Institute, although we usually have good ones, but this year our president and secretary took sick in the fall or winter, and by the time they got around to call the executive committee together we concluded we couldn't get the talent and speakers this year we wanted and so would not hold one, with the idea of doing better next year. We usually manage to have pretty good institutes, but the officers of the county institutes are elected from the old men. You can all see I am no spring chicken and I am the youngest one. I hope next year they will elect officers that won't get sick.

Stephenson County—

Mr. ——————: The eighth annual county institute was held in Freeport on the 15th and 16th of January, with J. A. Phillips as president. We have a vice president from each township, and change our presiding officer each year, usually electing comparatively young men to fill the positions. The audience was so large at each session that we could not accommodate them with standing room. We always help to defray the expenses with advertising in the program. An effort was made to have the farmers occupy the advertising space. We try to characterize the institute with some special line of agriculture. This year corn culture and hog raising were the principal topics. The Domestic Science association occupied the second afternoon.

Shelby County—

W. E. Killam: Shelby county held a session of its institute the last of October, 1901. The program was quite an interesting one and the attendance was very good. The session was held at Stewartson in the southeastern part of the county. We have adopted the plan of moving around in order to give the people a chance who live a long distance from the county seat. So far we find this is a good plan. The ladies have organized a Domestic Science club at each place so far. We are going to hold another session at Windsor the 26th and 27th of this month and expect to have an interesting meeting. We send our greetings to the State institute and wish it a successful session.

Tazewell County—

Mr. Ralph Allen: I can't understand why so many counties are not making reports. I know there are representatives from those counties here and I think they ought to make reports. Don't you think so? Our county held an institute at Hopedale Dec. 17 to 19. We had good attendandce, very satisfactory attendance, and it was satisfactory not only in numbers but in the character of the people who attended. There were a large proportion of young men and women present and this I consider the most encouraging feature that an audience can show, is the young people who attend. It seems to me almost folly to carry on an institute year after year when the bulk of the people who go and attend the institute are old people. It is the young people who must be taught, not the old ones, and the attendance was composed largely of young men and young women, and both of them took an equal interest in the work, and one large feature of our programs has always been the intermingling of the work, not have the ladies' work all on one side of the house and the men's work on the other. The interest seems to be just as great, and I notice when a man talks on corn or live stock that he holds the attention of the ladies just as well as the men, and it is just the same when the woman gives the talk on some of their topics; the men are equally interested, and I think the intermingling of the programs is a good feature.

Children's essays were an added and new feature and we had 34 competitors, and like the reports from other counties, we think this a good feature. They were all good essays and all should have received some sort of a premium. In institutes we want both the progressive and the conservative. There is a strong element in our county, and I suppose in others, who think that an institute should be conducted almost entirely by men of experience, to tell what they have learned in their own experience. That is a very important thing, to develop the experience of the farmer; but equally important is the progressive element. If you keep on telling your own experience over and over again, it gets old and people get tired. You must have something new, and in fact we have found that we can get no better instruction than from our experiment station, and it has been our policy to draw heavily from that source. Of course there are other sources you can draw from, but that is the main source; and after these subjects have been brought forward by the experiment stations, it has been a very good thing for the conservative element to discuss them and pass their opinions upon them. I think that is all I can say, except about the one feature that the institutes are so free from the the immoral elements that follow so many of the great conferences of agricultural people, and is one of the grandest features of the institute.

Vermilion County—

J. H. Oakwood: We held our institute at Ridge Farm, Jan. 22 and 23, with increased attendance and with increased interest. In fact the attendance was the best we have ever had. We had no special feature in the way of prize exhibits, in fact we are not in the dairy district. We had Mr. Grout, Otwell and Galbraith in addition to our home talent, which we try to use and we try to get practical men; we like their ideas better than the theory of some others. We have the young men with us. We had no Domestic Science meetings. Prof. Parker gave us a lecture, and I want to say to you that unless you have heard him talk you have lost a great deal, but I don't know as you could get him to talk if you did want him. The parties having charge of the land in that locaility are largely tenant farmers, and they reported large increase of corn as the result of that lecture. Prof. Parker was worth to us all our institute has ever cost us, and I believe that lecture in the course of time will increase the product in corn ten bushels to an acre. I don't know as I have anything further to say further than that we are anxious that our institute may grow in interest and good results may continue to follow.

Warren County—

Mr. Cobb: Warren county is always behind when it comes to the alphabet, otherwise she is A always in institute work. Everyone who attended our institute this year was very much pleased with the decoration of the hall. That is something very little attention is paid to. The hall was decorated this year so that it made it very beautiful and we undertook to get a photograph of it, and as I have heard nothing from the artist I presume it was a failure.

In regard to the work we have accomplished, I will give an example of what has been gained. A year ago we had a gentleman with us who was on the program for a talk on "Angora Goats." I heard several farmers say before that meeting "What do you want of Angora goats? What is as Angora goat?" After the gentleman was through with his talk I don't think there was a farmer that heard him but what was vitally interested in the Angora goat. This year I was one of the committee and I put on the gentleman who gave us a talk on "Angora Goats," a gentleman who has 250 on his farm in Warren county, and last summer he loaned those goats to his neighbors as grubbers. He stated those goats had done him a great amount of good and he had samples of the brush and young trees they had girdled and killed.

Mr. ————: What do you raise?

Blue grass pasture, the finest in the world.

Four years ago I brought to Warren county the only hand separator in that county. It was a curiosity then. Now there are over 60 and they have not only increased the product of our dairies but have greatly added to the quality.

Another feature that pleased me very much is the fact that the institute is teaching the farmers and feeders how to keep their stock in condition and showing us the value of cotton seed meal, which we can get shipped right in to the little stations now, and the health and condition of the stock in our county is over 25 per cent better. I heard a gentleman say the other day that he made more money last year than he ever had before. We had another professor who told us the aim of every professional farmer should be to kill the germs of smut in his oats and his talk has largely increased the yield and quality of oats.

Our hall could not hold the attendance this year.

Whiteside County—

C. Wetherby: Our 17th institute was held at Sterling during the first week in December. We usually hold two of one day and one of two days. We hold the meetings in various parts of the county and we find the people more interested in it each year. We had a very interesting meeting, with large attendance and good discussions. We had a committee on decoration and the hall was very prettily decorated with corn, vegetables and bundles of oats and millet. I would say we usually have a committee on entertainment and we entertain free all persons outside of the town where the meeting is held.

Winnebago County—

David Hunter: The institute for Winnebago county was held about the middle of January. I don't know as there was any more interest this year than before. The only difficulty we have ever experienced in the work has been the finding of a hall large enough for the people to get in who wish to come. I could say to my friend from Moultrie county that Winnebago county is full of cranks on the subject of institutes—that is if we call a man a crank who loves his work and loves it almost more than anything else. I take it that one of the objects of our institute has been the interesting of young men in the work of the institutes. They have been increased, but I don't know as there is anyone young or old in our work. I believe the man who loves his work, as the farmer ought to love it, never gets old; that he is always young. Of course in Winnebago we have some special lines of farming. The dairy interest is a very great interest. That is one thing that always has attention. Every question that will interest the rural dweller, the question of roads, the question of schools, has been discussed by the best obtainable talent from anywhere that could be found. We are up to date. We have been there and shall be in the future.

Will County—

Frank Sprague: I have no written report for Will county. We held a three days' session just a month ago which was very successful. We held our institute in the opera house, it being the only large building except the Township High school, and we were packed into that opera house. It was very successful. We held also an exhibit of farm products, which is sold after the institute and the proceeds used for the benefit of the institute, and this year one main feature of the institute was the last day we held the session in the Township High school, and Prof. O. J. Kern was present and gave a talk on "The Centralization of Schools." It took very strongly with our people, and I think they are all in favor of centralized schools, and until today I had supposed that we had the best county institute in the State, but I see there are lots of others that think the same. I am glad every county enjoys the same privileges, but I think none have a better institute than we.

Washington County—

Mr. A. Hinkley: The two days' session, Nov. 19 and 20, was well attended by an interested audience. The interest in these meetings is growing fast and there is a remarkable difference between our first meeting, four years ago and the one just past. The number in attendance has increased from a mere handfull to a well filled house. There has been no agricultural exhibit made at any of the meetings.

Our people are much interested in the subject of soil improvement and information on that subject is always desirable.

It is hoped that through the work of the Agricultural Experiment station rapid advancement will soon be made along this line.

There is a sub-station located in our county where different methods of soil improvement will be tested. A portion of the station ground has been tiled to test the effect of tiling on our heavy clay soil. Experiments will be carried on to test different commercial fertilizers, not the different brands but those possessing one element in excess of others, as dried blood for nitrogen, bone meal for phosphoric acid, etc. Leguminous crops will be grown and handled in different ways.

There are several of our farmers who are experimenting with different crops for feeds and soil renovation, such as cow peas, soy beans, vetch, rape, sorgum, turnips and beets, and report results at the meetings. This is an interesting feature that could be carried on to advantage in every county of the State.

It is held by some of our farmers that the State should make provision for the payment of live stock lost by hydrophobia caused by rabid dogs. There is objection to the general government assuming the expense of irrigating the arid districts of the west, as there is now talk of doing. Let those who are interested in these lands assume the expense of this work. As well might the government assume the expense of constructing and maintaining good roads for our section of the country, which we all know would be of great benefit to all farms situated where the roads get nearly hub-deep in mud almost every winter.

Wayne County—

Mr. E. A. Rankin: Our institute is still in the line of progress, the interest in the work growing better each year. Our meeting last October was the best ever held in the county. We are working on our program for next year.

The Domestic Science association is well organized and holds meetings regularly each month.

President: The reports from the county institutes this year, I am glad to say, show increase in attendance and are much better than they have been for years. Of course it is nothing but natural that when the county delegate rises to make the report he would like to say "our county was the best, or was as good as the best," but speaking from observation of what I have seen personally and from the work actually done, I am glad to say the attendance was much better than ever before. A greater interest is being aroused not alone among the men who are seeking to advance farming to something higher, but it is reaching the young men and the young ladies, and great help is rendered by the Domestic Science associations and by the county superintendents. Many of the county superintendents are city people and do not realize the great good that can be done by the Farmers' Institute work, but when we have reached them we find great help from them. Many are actively engaged in the work, some as presidents and secretarys, and we find great help from them.

Mr. Coolidge: I move all resolutions be handed in without discussion. Motion adopted.

REPORT OF THE OLD 7TH CONGRESSIONAL DISTRICT.

Agricultural conditions in the New Tenth district are looking up. Land has advanced in value, especially farming land, anywhere from 10 to 50 per cent in the last two years. And even the politicians are getting interested in the farmer. The agricultural college is being looked upon by the farmers as a help. And where a few years ago we hardly knew we had one, now we have a good representation of scholars at the Agricultural College at Urbana. And we are glad to know that the faculty of that college stand second to none in the United States, and the students very enthusiastic in their studies. The Farmers' Institute is firmly established in the district and the county officers are waking up to the possibilities of their position. Two very good institutes were held in Lake county, which were much better attended than ever before. The farm homes of the district are of a high order, and while organized effort by the farmers to better their condition in all lines comes slowly, the growth is good and we see greater things ahead. Better methods of cultivation are being adopted. Better stock is being grown; and the moral and spiritual growth of the coming farmer and his wife is being looked after to a greater extent than ever before.

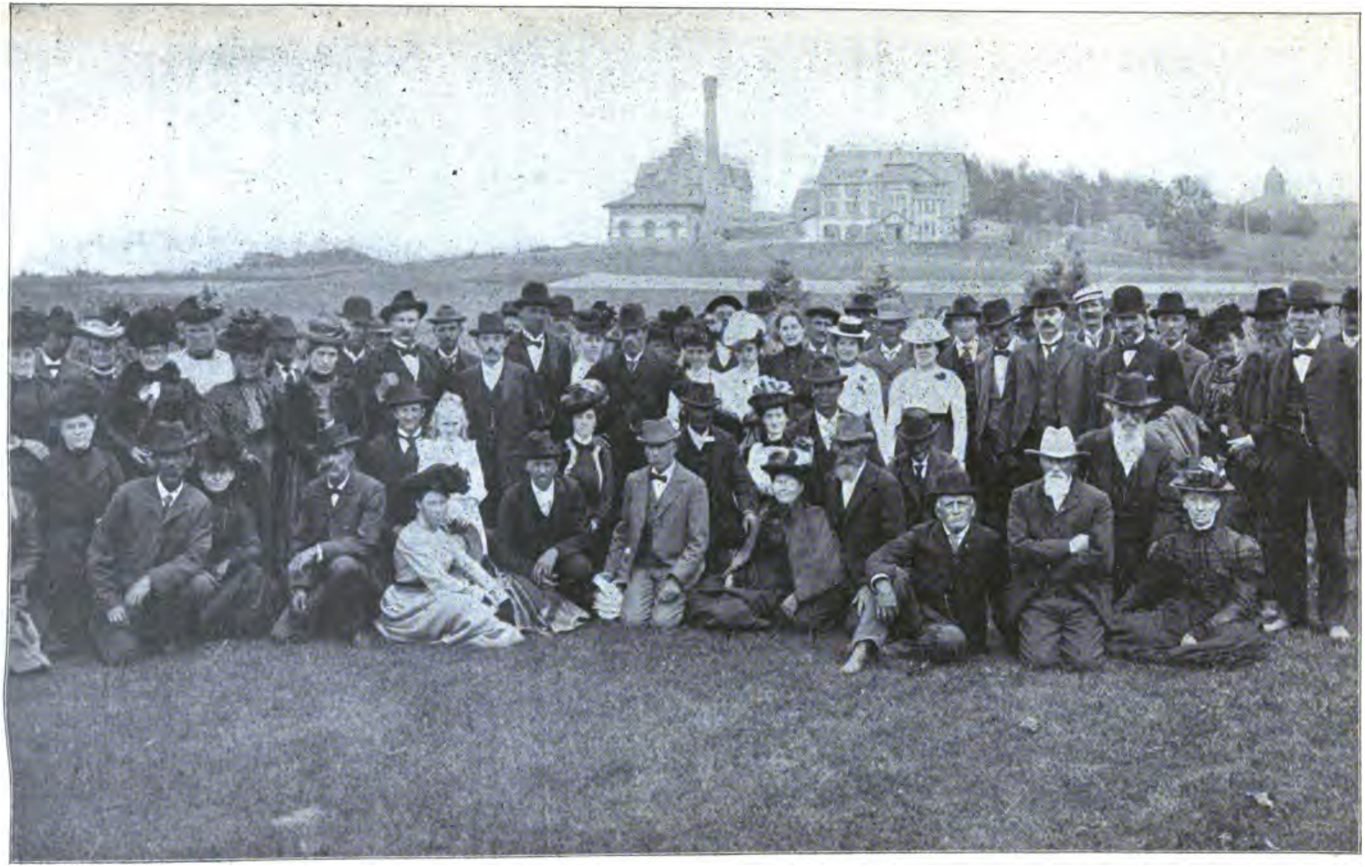
People are waking up to the idea that the farm is not only the best place in the world to be born and reared but is also the best place to die.

They are not only living on the farm to make a living, but are waking up to the idea that a longer life can be lived on the farm than anywhere else.

Respectfully submitted,

H. D. HUGHES,

Director Old Seventh, New Tenth District.



Some of the McHenry County Farmers' Institute Picnic Excursionists on the Wisconsin Agriculture College Grounds at Madison, June 4, 1901.

REPORT OF THE 8TH CONGRESSIONAL DISTRICT.

MR. PRESIDENT, LADIES AND GENTLEMEN: I take pleasure in submitting for your consideration, the following report of the institute work in the eighth congressional district.

The interest in the work has increased rapidly, each year, until we now have a large attendance at the meetings and an interest and enthusiasm is developed that is indeed gratifying, and influence goes out from these meetings that is felt throughout the state. The farmers are becoming more and more interested and enthusiastic in their work; they are thinking, investigating, adopting newer methods, they are becoming inspired by the dignity and importance of their vocation as farmers and are respected and looked up to, by all classes of people, and it is now no trouble to secure proper support for the institute work.

The eight district is composed of the following counties; DeKalb, DuPage, Grundy, Kane, Kendall and McHenry; these counties have all held meetings during the winter with the exception of Kane county.

DeKalb started out with a three days meeting at Hinckley, Dec. 26, 27 and 28; the attendance was large throughout and the interest greatly increased by the excellent exhibits of agriculture, dairy and culinary products.

Kendall came next with a two days meeting at Yorkville, Jan. 21 and 22. The attendance, while not so large as at Hinckley, was good throughout and much interest manifested.

McHenry came next with a four days meeting Jan. 21, 22, 23 and 24; two days at Hebron, in the northern part of the county and two days at Nunda, in the southern part of the county; these were by far the most interesting, practical and enthusiastic institute meetings ever held in McHenry county, and at many of the sessions standing room was at a premium. The corn exhibits were excellent and attracted a great deal of attention.

The congressional meeting was held with the Grundy county institute at Morris Feb. 6, 7 and 8, and while the local attendance was not so large as at some of the other meetings, an excellent program was rendered, the corn exhibit was fine, great interest was manifested and the work organized in good shape for the coming year.

DuPage county held a three days session at Wheaton, Feb. 12, 13 and 14, with an excellent program, covering a wide range of topics. The fine exhibit of agricultural, dairy and culinary products and demonstrations of work done in the rural schools, created great interest, and the attendance was the largest in the history of the organization.

Kane county, which is noted for the high character of its institutes, will hold its annual institute meeting Feb. 25, 26 and 27, 1902.

The programs of the above institute meetings were, without exception, of a very high order of merit; a wide range of topics were presented, explained and discussed and much good accomplished.

In this great dairy district which produces annually, over 6,000,000 pounds of butter and 600,000,000 pounds of milk; too much attention can not be given to improvement in the average quality of dairy products, in the average quality of dairy cows, in the sanitary condition of dairy barns and in every item which has a tendency to increase the value and lessen the cost of dairy products; and in view of the fact that this district maintains over 1,000,000 head of live stock and produces annually over 500,000 acres of corn, 300,000 acres of oats and devotes 200,000 acres of meadows and nearly 500,000 acres to pasture lands and about 10,000 acres to potatoes; it is certain that too much attention can not be given to improvement in the average quality of live stock as well as to the yield and quality of farm products. The average yield of 38 to 40 bushels per acre of corn in this district can surely be raised from 2 to 10 bushels per acre, by careful selection of varieties, careful breeding and proper cultivation of the soil, to conserve moisture. There is also as much room for improvement in oats and other grains, and the average of 80 or 100 bushels per acre of potatoes can, without a doubt, be increased to 200 or 250 bushels per acre, by careful selection of seed varieties, proper preparation of the soil and proper methods of cultivation.

The question of tile drainage for highways is of great importance and should receive more attention, as it is the cheapest and in fact the only method of securing a dry, hard road-bed.

The labor question is one of great importance; wages paid farm hands in this district are 20 per cent higher than in central Illinois and 35 per cent higher than in southern Illinois, and still reliable help is scarce here which is positive evidence of the fact that milking cows is not a favorite pastime with the average farm hand.

The question of increasing and maintaining the fertility of the soil is an important one and every available ray of light should be shed on this subject; and I believe that a great deal of good might be accomplished by the appointment, in each county, of committees of one or three as the case may require, to study and investigate the conditions which exist in the various lines of agriculture; these committees to report at each annual meeting.

Every possible means should be employed to secure the interest and attendance of the young people and I believe the only way to do this successfully, is to give them a share of the work to do; encourage them to conduct some simple experiments in stock feeding, or in growing crops and give them an opportunity to report the results at the institutes. The study of domestic science is surely progressing and should be encouraged in every way; truly there is no art or science the study of which is of so much importance to the young women, as the study of the art or science of housekeeping and home making.

A dozen or more of our young men 'are attending the Illinois College of Agriculture at Champaign; these young men are deeply interested in their work, and when they have completed their course, they will have the best possible equipment for success in their chosen field of labor, and great good can be accomplished by inducing as many as possible of our boys and girls to attend the College of Agriculture.

The future prosperity of this country rests in the hands of farmers; hence in order to enjoy the fullest measure of prosperity, we must have more liberally educated and scientific farmers; men who have been taught to think, study, experiment and investigate along agricultural lines. The secret of success in agriculture is education, but it must be a practical education, an education that shall instruct and interest, an education that shall fill the farmer with enthusiasm, that shall inspire him with an ambition to excel and awaken within him a feeling of pride and respect for his calling, and an appreciation of the opportunities and advantages of farm life. The mediums through which this education may be acquired may be found in the agricultural colleges, the agricultural press and the agricultural organizations.

Our best educators agree that no other one influence is so powerful for improvement in agriculture as the Farmers Institute, where new discoveries and new experiences are discussed and applied to local conditions.

The institutes of this district have used every possible influence, in their endeavors to disseminate useful agricultural knowledge, but I am fully persuaded that the good work which has been done during the past few years, is but a dim reflection of the great good which shall be accomplished during the year which is now before us.

Respectfully submitted,

GEO. A. HUNT.

Director, Eight Congressional District.

REPORT OF THE 9TH CONGRESSIONAL DISTRICT.

The crowded houses show the increased interest of the farmers to learn the up-to-date methods of agriculture. In many cases the overflow is larger than the full attendance a number of years ago. No lady has been found willing to accept the office of director of domestic science. The reasons given are lack of State aid and time. I hope the officers of the State Farmers' Institute will include an appropriation in their next budget for the Domestic Science association.

AMOS T. MOORE,
Director.

Feb. 20, 1902.

To the President of the Illinois State Board of Farmers' Institutes:

DEAR SIR—Herein I submit a report of the agricultural conditions of the Fifteenth Congressional district under the old apportionment.

Generally the soil has been well preserved by a uniform rotation of crops. The farmers almost entirely depend on clover for fertilizing, except that produced by feeding their whole crop upon the farm, after marketing all the small grains and the surplus hay. In Adams county, of the stock handled, hogs are in the ascendency, yet with cattle enough to consume all the roughness. There is occasionally a farmer who feeds from 50 to 100 cattle. "Corn is king" here, but wheat and oats are not neglected. Rye is being more cultivated because wheat has lately failed, but with wheat we succeed best in getting a stand of clover. One-third of the cultivated land is always seeded down to grass, either clover or timothy. From these we set aside enough to make hay for home consumption, clover hay being much favored on the farm for all purposes. Timothy hay pays a better profit than almost any other crop, and large meadows are grown for market.

This county has imported a large amount of corn this year on account of the great drouth, which caused the yield (from 42 bushels per acre on an average) to be reduced to about ten bushels per acre. Therefore feed is higher here than in any other part of the State.

Quincy, our county seat, takes all our surplus feed at high prices, therefore some of our tenant farmers sell all they raise instead of feeding it on the farm. What we have said of Adams county will cover the conditions of Brown county also.

The counties joining Adams and Brown on the north, to-wit: Hancock, McDonough and Schuyler, had a more favorable season and raised on an average one-half a crop of corn, with wheat, oats, hay, etc., in the same line with the favorable agricultural conditions. They also feed their crop to stock on the farm, but are inclined to feed cattle on a little larger scale. They have quite a sprinkle of tenants (which is not the best thing to have) who sell their crops instead of feeding them.

The farther north the better the crops grew. Therefore in Henderson and Warren counties, the last two in the district, we find still better agricultural conditions, and with fair crops, good farmers, and choice soil added to sterling integrity and business principles and economical habits, the farmers are enjoying a healthy wave of prosperity; but unlike the other counties their farms are very large and they are occupied by more tenants. However, their buildings are good and roomy. The cattle industry prevails to a larger extent than in any of the other counties in the district. In passing through those counties last June we saw large herds of cattle in pastures along the line, some of them black poles, some shorthorns, and some whitefaced, all of them in good condition.

This is too far north to raise fall wheat. They sow clover with oats and seem to have good pasture.

We were told by good authority that the most of the tenants sell their grain either to the landlord or at the railroad station, whence it is transported to the point where it is most needed.

In passing through these counties either on the "Q" railroad or otherwise in the cornshelling season, we always see cornshellers at work. Prominent citizens told us that it would be safe to say that one-half of the surplus raised on the farm by these tenants was shipped to market.

Many of the landlords live in towns where there are good schools; in the country school districts are large and the schools sparsely attended. These counties laid in and occupied most of what is called the military district, which is renowned for its fertility and intelligence. Each one of the counties held one or more institutes, all well attended; and especially the institute held at Adrian, where over 100 people were turned off for want of standing room.

We herewith submit a tabulated statement of the live stock of the old Fifteenth district for the year 1900, giving the number of cattle and hogs, also the bushels of corn raised in each county, respectively:

Counties.	Bushels of Corn.	No. of Cattle.	No. of Hogs.
Adams	1,614,448	33,824	53,771
Brown	237,372	11,507	17,853
Hancock	1,991,340	10,674	44,265
McDonough	2,131,125	38,782	58,487
Henderson	1,262,256	15,068	21,753
Warren	2,460,312	43,124	46,467
Schuyler	720,709	22,700	33,057

In addition to the above, horticulture is among the industries which are on the increase. Large young orchards are being grown under improved conditions. Dairying is also assuming larger proportions and becoming an industry worthy to be mentioned, as is also intensive gardening, the raising of small fruits, etc., etc.

Among the agricultural conditions the poultry industry is more general and under better management, with up-to-date conveniences, is a source of revenue which, when considering the cost, gives a satisfactory profit.

G. W. Dean,
Director.

REPORT OF THE 19TH CONGRESSIONAL DISTRICT.

MR. CHAIRMAN: I am very glad to be able to report that all the counties in the Nineteenth district have held successful institutes during the past year. While the object of these meetings is to educate the farmer and to keep him in touch with new and improved methods in agriculture and rearing and feeding of farm animals, yet there is also a social side to be considered. I notice that this spirit of sociability is increasing in our meetings and men and women gather from the different parts of the country not only to listen to the instructions of the speakers but also to form new acquaintances with those living in the different neighborhoods of the county. Those farmers who believe in the improvement of farmers and farm homes are always present and it is strange but true those who most need help upon the various subjects of farming are as a rule absent from our institutes. I hope that the influence of our meetings may continue to spread until all classes of farmers may be led to appreciate the benefits of them. As our farmers' institutes are a means of education I think that county superintendents, teachers and pupils should be solicited and encouraged to attend our institutes.

Our programs should include some work to be done by the boys and girls who attend our rural schools and whose early lives are necessarily spent upon the farm. I think the Domestic Science association is a means of great good in connection with our institute work. In some institutes this department was a leading feature of the institute, the topics read and discussed were the most practical, the interest and enthusiasm was greater than previous meetings. I believe the women's session should never be omitted, I think it is destined to be a leading feature in our farm institutes. I can predict nothing but success in our district. The officers in each county are strong men and women and fitted to represent the interests of the county in which they live; they each and all have labored to secure a program for their meetings and by every means have tried to have a large attendance. I feel proud of the work done in our district the past year, and trust that the spirit now existing may continue. Our organization is not perfect, many parts may be strengthened. I hope that each one may feel it to be his duty to assist in making it one of the strong organizations of our State.

D. H. SHANK,
Director.

TUESDAY AFTERNOON SESSION.

"America," led by George N. Holt of Rockford, and sung by the audience standing.

President: I have the pleasure of introducing to you this afternoon Col. A. E. Fisher, a farmer, a country boy like the rest of us. Raised on a farm, and since then has upheld the stars and stripes in our war with Cuba, and now in business in Rockford. He is one of us, one of the farming class, though not at the present time actively interested in farm work.

Mr. Fisher: MR. PRESIDENT, LADIES AND GENTLEMEN OF THE ILLINOIS FARMERS' INSTITUTE: We are exceedingly glad to have you with us today. Some time during the early seventies a fellow down in Southern Illinois leased a home to another man for a year at a rental of $10 per month, and when the tenant moved in he found that the roof was full of holes and the rain came through and it offered no protection to himself or family. He asked his landlord to repair the roof, but the landlord said that he had his lease and that didn't call for any repairs and therefore he refused to do anything, and at the end of the month when he demanded his rent his tenant refused to pay but the landlord sued and recovered a judgment of $10 for the month's rent against the tenant and the tenant appealed the case to the appellate court and the appellate court handed down a decision affirming the $10 judgment of the circuit court, and in the opinion the judge says, that when a tenant takes a house without any special contract concerning repairs he takes that house as does a man his wife for better or for worse. So my friends you are with us for a short sojourn under our roof for better or for worse. We hope there will be no holes in the roof. We hope that you will be amply and fully protected, and that when you return to your respective homes after your sojourn among us you will say to yourself that it was very good.

I am glad to welcome you to the pretty city that we claim to have here in Rockford, and I might call your attention to some of the leading, perhaps most interesting, features which you might visit while here. We have something like 30 or 35 miles of street railway which will convey you to the beautiful residence portion of our city or take another line to the hives of industry, the factory districts. This city ranks second only in the west in the manufacture of furniture. This city sends her Rockford socks the world over, manufacturing over 10,000 dozen socks per day. We have the most beautiful churches to be found in the west in the smaller cities. Our hotels rank second to none in the State of Illinois outside of Chicago, and we are glad that you are here to enjoy for a short time some of these things with us, and we hope you will take with you to your homes the impression they make upon you.

I am glad to note that the Farmers' Institute keeps pace with the age of progress in which we are now living.

As has been stated by your president I was formerly a farmer. I farmed for 24 years, engaged chiefly in the dairy business at first but later got interested in general farming and stock raising, and for the past 15 years I have been a resident of Rockford endeavoring to sell wind for a living. Now I will say to you, my friends, that the callings are not to be compared. I look back with the greatest of pleasure to the scenes on the farm. I can never forget the fall of the year when the harvest was garnered. I will never forget the sight of that cellar on the farm with its large bins for the apples and potatoes and the other smaller bins of other vegetables, and after we had butchered three or four pigs and one beef, and through the fall and winter evenings my father would turn the hand sausage mill while I fed it from a pan, and how my mother in the spring would take the hams and pack them away for the summer, and the barrel of pork, salt pork, salted for the summer use and the surplus of apples that weren't used in the fall made into barrels of cider to turn into vinegar, and I remember one side of the cellar with its rows of barrels of cider turned into vinegar, and when I think of that cellar so filled, when I think of how we had a guarantee from hunger at least for months to come at that time, and then when I think of my own little cellar up here on the street, and my wife tells the grocer to send up a half peck of apples, or possibly a peck of potatoes, or perhaps half a pound of chipped beef or a pint or quart of vinegar, and you can go into the cellar and in one meal you have used it all perhaps, I can't help but think of the contrast.

I am glad to see that the farmers of Illinois are keeping apace with this progressive age in which we live. When my father came to the west from Massachusetts he forded the river here in Rockford in June, 1839, and a little later located in the adjoining county south, Ogle, near Byron, the place where our family was born and raised. He farmed the land he took up as government land until after I came to Rockford 15 years ago and I was not the oldest child by any means, there were four or five older. At that time my father, I have heard him say, looked upon this vast prairie in Illinois as something of a desert, a semi-desert as it were and he hunted around and found a piece of land that ran down to the river and had timber. He would not take the open land. There was nothing to keep you warm. And yet the progress this State has made through such agencies as the Farmers' Institute is testified to now by the magnificent homes and buildings and surrounding you find dotted all over the prairies. You find the most cultured and refined people in the State of Illinois on those farms and in the farmers' homes, and by the way, my friends, if I am ever permitted to retire from active life it will be to a home on the farm. It will be to a place where I can garner as I used to at the old home, the vegetables, the apples and all the stores we had in the cellar in the fall season. It will be where I can have the independent thought and action that can only be had upon the farm, and the advantages of ingress and egress now with interurban railroad and rural delivery you have the advantages of the city resident upon the farm without the disadvantages.

As was said by the court you take the house as the man does his wife for better or for worse. There are times when we receive each. I have but little knowledge of the southern part of this State, although I know that some of you have traveled from that extreme southern portion, but I have heard that down there they have but little use for preachers. My information in that regard was somewhat affirmed by a little incident which occurred down there last fall. Our very honorable mayor of the city of Rockford, together with a few of his friends who like to shoot quail went down that way and they stopped at a little town called Tamaroa. Now I do not know that it is a little town but I assume it is little although it produces some great men—I am not referring to this preacher. During their perambulations they met this very reverend gentlemen who had quit preaching and gone to farming and from all reports he was much more of a success as a farmer than as a preacher, but the quails strayed onto his land and the Rockford gentlemen strayed after them and they had some words with the preacher, and the result was that before they got through with the matter they had to walk up to the captain's desk at police court and settle. That perhaps does not have interest to you as members of the Farmers' Institute, but I am very sure it did have some interest to one of your members because I was informed today by your chairman that the first fellow he called upon was the mayor and that he had got it fixed up so there woud not be any trouble while here.

I had a slight experience with a fellow down south. The distinguishe gentleman who is to respond to the welcome comes from the city of Springfield, and I am fortunate or unfortunate, as you may term it, to have the command of the Third Illinois National Guards regiments and when we go into camp one of the first things is to instruct the soldier in his discipline and I found at our last encampment a fellow running a "blind pig" in a tent. You all I guess know what a "blind pig" is. And I sent him word to quit, and as he did not I sent a lieutenant with a squad to bring him in and they brought him in, and they said they did not have to stop unless I had a warrant so I sent them to the guard house and at the end of four hours they sent me word if I would let them go there would be no further trouble and on that assurance I let them go, but before the week was over the sheriff came up to my camp and he served two summons upon me for $10,000 apiece, $20,000 damages. We went down and tried the case in Sangamon county, and the judge for whom I have a profound respect, instructed the jury to find the defendants not guilty. So I say we must take it for better or for worse, but I want to say that regardless of the slight occurrence down there at Springfield and regardless of the time of the mayor had his experience at Tamaroa we want you all to have a good profitable session during your stay in Rockford and I want to say we have one of the most magnanimous mayors in the city of Rockford that presides over any city in the State of Illinois or anywhere else. Knowing that you were coming, what did he do? Yesterday before your arrival, if you had watched him you would have seen him take the keys of the city of Rockford in his hand, proceed to the police court and there locking the door, and then going upon the river and boring a hole in the ice and throwing the keys to the bottom of the river.

My friends during your sojourn among us the city of Rockford and county of Winnebago is yours, and I bid you welcome, yea thrice welcome, to this city of ours.

President: I am very glad indeed to be so heartily welcomed to the city of Rockford. I suppose the mayor's action was taken knowing the conditions as they are in northern Illinois, but down in Egypt and around Tamaroa the preachers have gotten in their work ahead and it will not be necessary for such protection, especially not necessary for Egyptians.

I have the pleasure of introducing to you Colonel Mills of Springfield.

Colonel Mills: I think you have all heard of Rockford socks. We all have Rockford furniture in our homes, and whenever we want any good legislation we come to Senator Andrus of Winnebago county for it and I can tell you he was the father of the best bill that has been introduced into the legislature, and I am sorry he is not here. Geo. W. Curtiss of Jo Daviess of this district has the honor of having done a great many excellent things for the agricultural interests of Illinois. You have one of the greatest breeders of Illinois in your county, Mr. Lovejoy. There are a great many things that Rockford, Winnebago and this district excel in; but I have been placed on this program to give a fitting response to the address of welcome, and as I never know when to stop unless I confine myself to a paper, because then you have some encouragement, I will find a stopping place.

RESPONSE TO ADDRESS OF WELCOME.

MR. PRESIDENT, CITIZENS OF WINNEBAGO COUNTY AND MEMBERS OF THE ILLINOIS FARMERS INSTITUTE: It has been a great pleasure to this large and intelligent gathering of the best people of this peerless State to listen most attentively to the cordial, hearty and eloquent address of welcome from the citizens of Winnebago county, so sincerely expressed by Mr. Fisher, who in a very gracious manner has voiced the greeting of hospitality and good cheer extended to the Illinois Farmers' Institute on the occasion of its seventh Annual State Meeting.

On behalf of the Illinois Farmers' Institute it is my great privilege to respond to the welcome extended, and to assure the speaker and his constituents that the cordial spirit of the welcome is most heartily reciprocated.

This large and splendid assemblage of intelligent and progressive farmers gathering from all sections of this premier agricultural State is the most eloquent that can be presented to the citizens of Winnebago county of our high appreciation of the preparations made for this meeting.

It is due the local committee to say that the very complete and satisfactory arrangements made for the entertainment and enjoyment of all in attendance at this conference will add much to the brilliant record of the Winnebago County Farmers' Institute and the intelligent and prosperous class of farmers it so creditably represents.

Much has been expected of this meeting, and it is safe to say that an appreciative audience, such as is gathering here to-day, will vote the Rockford conference of the Illinois Farmers' Institute the most interesting and successful of the series of very instructive annual state conventions held by this organization.

The committee appointed by the Illinois Farmers' Institute to prepare the program for this meeting anticipated the complete arrangements that have been made by the local committee for the entertainment of this intelligent audience and have made corresponding effort to provide such a range of topics and such ability on the part of the speakers as will ensure a full measure of enjoyment and instruction to all in attendance.

It may not be out of place in this connection to call brief attention to the rare excellence of the program that has been prepared for this meeting.

The address of President Kinzey and the report of Secretary Hostetter will contain a review of the work of these faithful and industrious stewards, and the showing made of the rapid and healthy growth of the Farmers' Institute work in Illinois during the past year cannot fail to cheer and encourage the advocates of this very efficient and popular agency for promoting the interest of all engaged in rural pursuits.

The class work each morning on corn culture by that original investigator and able leader in the study of this all important cereal will largely increase the general fund of information on this subject and will add new laurels to that popular teacher, Prof. A. D. Shamel.

The class address on domestic science each morning will certainly be largely attended by all the ladies of this convention, and there will be no lack of interest in the proceedings.

That very successful promoter of better home making will confirm and increase the widespread esteem entertained for the pioneer in the advancement of household science in this State, Mrs. H. M. Dunlap.

Prof Blair's popularity as an eminent authority in all matters pertaining to horticulture will ensure him each morning a large and appreciative audience of parties interestedin fruit culture.

Prof. Mumford, who has charge of the animal husbandry work in the college of Agriculture, University of Illinois, is so well and widely known as an able and interesting instructor in this line of study that we can speak postively of the great satisfaction that will attend his class work each morning.

The program for the dairy session prepared by the State Dairymen's Association, the session in charge of the Illinois Association of Domestic Science, the topics and speakers presented by the Illinois Live Stock Breeders Association, Illinois Horticultural society, ensure the presentation of the most advanced thought on lines of study by leading authorities well known as popular speakers.

The evening session with such unexcelled attractions as Kerrick, Carter, Kern, Bradfute and Miss Hostetter will ensure crowded houses and a full measure of enjoyment and benefit.

That splendid leader in the campaign of centralized schools, Prof. O. J. Kern, the county superintendent of schools for Winnebago county, has provided a very unique program for the boys and girls of the district schools which will not only be an original feature in the institute work, but will suggest a very profitable line of effort worthy of emulation. This session will be made very complete by the stereopticon lecture by Prof. O. T. Bright, county superintendent of schools of Cook county.

Not the least of the interesting and important sessions will be that devoted to the demonstriation of the results of the operations of House Bill 315, introduced into the Senate by Hon. Henry Andrus, of Winnebago county.

House Bill 315 provides for the co-operation of the practical and successful men engaged in all lines of rural husbandry with the scientific and progressive investigators directing the work of our State agricultural experiment station.

Under continued wise direction and the hearty co-operation that should exist between these mutual interested forces much practical information of great benefit to the agriculture of the State will be obtained.

Not a few of those present as they look into the intelligent faces indicative of the strong characters in this audience, hear the able practical papers of the speakers and listen to the dicussion from the floor will ask the very pertinent question, who is this sturdy young giant known as the Illinois Farmers' Institute that has been making such rapid strides in all sections of the State in the mustering into service of such an irresistible and patriotic force for the advancement of agriculture?

There are many in this audience who need not be told that the splendid campaign so ably conducted recently and carried into every farm neighborhood in this State that resulted in the construction of the largest, the most complete and creditable agricultural college building to be found in the world was the work of this sturdy young giant known as the Illinois Farmers' Institute.

It is well known that the influence so potent in creating such wide spread interest in the cause of agricultural education that has resulted in the increase of over 500 per cent in the attendance of students at the college of agriculture was exerted very largely by that sturdy young giant known as the Illinois Farmers' Institute.

The uprising in the thousands and thousands of farm homes in all sections of the State in the very general movement looking to the adoption of better methods of housekeeping, the more healthful preparation of food, and the establishment of such domestic relations as will ensure the best physical, intellectual and spiritual conditions was inspired by the young giant known as the Illinois Farmers' Institute.

The beautiful and worthy helpmate of this young giant, the Illinois Association of Domestic Science, has more than met the fondest expectations of its original promoters, and it may soon be said as a result largely of its benign influence, "that our sons may be as plants grown up in their youth; that our daughters may be as corner stones polished after the similtude of a palace."

Not the least of the splendid achievements of this young giant who has exerted such a wide influence in promoting the material, intellectual and spiritual interests of the rural population that can be reached, is the inauguration of the free circulating library that may be had in any neighborhood for the asking. We read that "In the selection and purchase of books for the Institute libraries only those are chosen which are known to be the best of their kind. The character of the books in each library has given complete satisfaction and the communities which have been so fortunate as to secure libraries have without exception made good use of the books."

Secretary Hostetter will doubtless give full particulars concerning the hundreds or more libraries that are doing such excellent missionary work in all sections of the State.

The pedigree of this splendid young giant is short and traces to the Illinois State Board of Agriculture which carefully nursed the infant in the eighties, when its secretary, assisted by Prof. Morrow, constituted the active force of aggressive institute workers in this State. A few members of the State Board of Agriculture and a very limited number of progressive farmers assisted for several years in the endeavor to hold congressional institutes at railroad centers in some districts.

The initial institute meetings had such a limited attendance as to discourage the local committees, and the interest in the excellent papers presented was very indifferent.

The institute movement was far from popular, and for some years it was difficult to locate congressional institutes or secure the presence, much less the co-operation of the citizens of the place of meeting or the attendance of the farmers adjacent to the town where the institute was held.

The suggestion of a county institute in the early history of this work would have subjected the party to ridicule.

Later a few county institutes were organized, and the good work slowly advanced until Hon. Geo. W. Curtis, of Jo Daviess Company, introduced a bill into the General Assembly providing $50.00 annually for each county institute.

Said measure required far more effort in and out of the legislature to secure its passage than was expended in the recent canvass that resulted in the appropriation of $150,000 for the State agricultural college building.

This small annual appropriation of $50 to each county institute by the General Assembly, and the more important aid thus given the movement in the way of State recognition of the great value of the institute work, served a most valuable purpose in stimulating county organizations.

In 1894 twelve county institutes through their duly appointed delegates met in Springfield and organized an association known as the Illinois Farmers' Institute, and this temporary association largely assisted in securing the passage, in 1895, in the thirty-ninth General Assembly, of the act creating the Illinois Farmers' Institute under whose auspices we meet to-day.

For the next two years the Illinois Farmers' Institute, without State aid, made an earnest and successful effort to organize county institutes, to hold State meetings and otherwise promote the work provided for in the act creating the same, for that of assisting and encouraging useful education among farmers, and for developing the agricultural resources of the State.

In 1897 the General Assembly manifested its high appreciation of the results attending the endeavors of the Illinois Farmers' Institute by making an annual appropriation of $7,500 for its work.

The continued and increased appropriations made by each succeeding General Assembly, and the rapid growth of the work in recent years by this organization, is familiar to this audience which will be quite unanimous in voting the results accomplished by the Illinois Farmers' Institute as entitled to the brightest page in the history of the development of the agriculture of the State.

I have just simply outlined to you what a magnificient foundation the farmers of Illinois have laid, the depth and breadth; what a magnificient development we have. I ask leave to print the remainder of my speech for the reason President Kimzey and the secretary and myself all touch on the same topics, and we have agreed that we will take or separate our respective parts in presenting the work of the Illinois Farmers' Institute and will try and make it very complete in your report.

PRESIDENT: We will now have the address of the Secretary, Mr. A. B. Hostetter, who has been with us for years and who needs no introduction.

REPORT OF SUPERINTENDENT OF INSTITUTES, A. B. HOSTETTER.

LADIES AND GENTLEMEN, CO WORKERS IN THE FARMERS' INSTITUTE, AND FRIENDS: It is very gratifying to meet so many with whom I have been in correspondence during the year, who have so faithfully and successfully promoted the institute work in the several counties throughout the State.

The success of a county Farmer's Institute depends upon the good judgment of the county institute officers in arranging a suitable program in ample time, in their energy in advertising the same, and their enthusiasm in carrying it out.

That there has been no lack in any of these essentials of success has been demonstrated by the valuable reports from delegates present this morning, and the formal reports on file in the secretary's office. The reports of the delegates have been so comprehensive in their scope, embodying the new, attractive and desirable features carried out during the year in the several counties, that it will not be necessary for me to go into details in regard to the work of the county institutes.

One hundred counties have held one or more institute meetings since the last annual meeting. Kane county will hold a meeting the last week in February, and Rock Island may hold a summer meeting which will complete the list. The institutes are growing more popular as their work becomes more practical and helpful. The average attendance this year has been larger than any previous year, being 375 in number as compared with an average attendance of 306 last year. The average cost per county this year is $98, last year it was $88.99, a total increase of funds raised by the counties for institute purposes of $918.

The greatest advance of institute lines has been in the character of the programs; less attention has been given to entertainment and show and more to instruction and practical results. The old time institute orators, the "big guns," who shot neither straight nor far, but who could startle or amuse an audience, have not been in much demand, but those who have had a sure and definite aim in their farm operations or live stock breeding, who have accomplished their ends and have the ability to tell their plans and methods which led to success, have had more calls for institute work than they could fill.

The district conferences of county institute officers under the direction of the several directors have proved very helpful in arranging circuits of meetings so that two or more counties could use the same speakers. These circuits could be extended to the advantage of both speakers and institutes.

The question of recommending speakers for county institutes who will meet the growing expectations of the institute officers, is one of the most difficult ones the board of directors has to solve. The demand for scientific instruction which can only be satisfactorily supplied by the faculty of the college of agriculture, has been greater this year than the ability of the college to supply. Every effort, therefore, should be made to strengthen the working force of the college of agriculture that more of it may be available for institute work. Prof. Davenport, dean of the college of agriculture, has always generously responded to calls for help from his department, often at great inconvenience to the college work. It is therefore due him that applications for help from the university be made at an early date.

The questions most popular and also of most vital interest to the farmer, which have appeared most frequently upon the institute programs, have been those pertaining to soil fertility and the improvement of our varieties or breeds of seed corn. The instruction heretofore given and the discussions on the selection of seed corn have led to such a marked improvement in the quality of corn produced and exhibited at the county institutes, that much enthusiasm has been aroused on this line. Students from the college of agriculture have been invited to judge the corn exhibits and to give instruction in corn judging. Their work has proven very satisfactory. The work done by Mr. A. D. Shamel of the college of agricultural has been especially valuable to the institutes and it is to be regretted that he could not attend more of the meetings.

The directors of the several districts, the county institute officers and the Domestic Science associations are all deserving of the highest praise for their year's work along institute lines.

SCHOLARSHIPS IN THE COLLEGE OF AGRICULTURE.

A very important part of the institute work has been to secure students for the college of agriculture. The institute directors have taken great personal interest in this matter; they have visited the several counties in their respective districts, and by personal interviews with the boys, their parents and families have impressed them with the advantages of an agricultural education to be obtained at our agricultural college; they have sent out letters and interested the local newspapers in the work; besides this, a large correspondence has been carried on concerning the scholarships through the secretary's office. As a result of these faithful efforts there are now at the university using institute free scholarships in the college of agriculture, nine students who are completing their third year of study and who expect to graduate in the four years' course; 55 who are in their second year and 103 whose scholarships began in September, 1901—a total of 167. The institute is justly proud of these boys and girls who are trying to fit themselves to become farmers and home makers. We feel that they appreciate their opportunities and that they will make good use of the same; that they will be a credit to our State and to the college.

It has been a great source of satisfaction to the institute officers and to those who have applied for scholarships, that the college of agriculture will accept boys just as they come from the farm, with such preparatory work as they have been able to secure in the country school, and it is able to give them practical help which will enable them to make farming more profitable and at the same time inspire the boys with a desire for self-improvement and culture.

As soon as it becomes generally known that a course of study at the Illinois College of Agriculture will increase the earning capacity of its students, there will be no lack of students; young men and young women who will make farming their life work, and who will make their own education a life work, who will become conspicuous examples in their several home counties of the benefits of scientific knowledge and scientific methods applied to farm and home work; who will strengthen the country school, improve the social atmosphere of the rural community, and develop and sustain the resources of the farm; and while accomplishing these results will attain for themselves a degree of culture unsurpassed by any other class of citizens.

For list of scholarships awarded see appendix.

INSTITUTE FREE LIBRARIES.

The advantages of free libraries to the rural communities were so evident and promised so much for the public good that the last General Assembly added the following section to the act making an appropriation for the Illinois farmers' institutes:

"For the purchase of books and for the maintenance and management of the Illinois Farmers' Institute free libraries the sum of two thousand five hundred dollars ($2,500) per annum for the fiscal years beginning July 1, 1901 and 1902."

From this appropriation there have been equipped since July 1, 1901, 70 libraries with a total of 3,100 volumes. There have also been purchased 120 bound volumes of Farmers' Bulletins which have been added to the libraries previously equipped and 115 volumes on household science. These last are in the care of Mrs. S. Noble King, secretary of the Illinois Association of Domestic Science, Bloomington, Ill., and the use of them may be secured by Domestic Science clubs on application to the secretary of the Illinois Association of Domestic Science.

During the present year 56 libraries have been returned from a six months' trip. These were scattered over the State in 48 counties. The reports of books read, as per the stub-book records of the local librarian, show that 4,094 books were used, an average of 73 loans for each library. Some books were read oftener than others, and in some libraries a few books were not read at all. Books of essays, biography and science were read almost as often as those of fiction, and the total of the loans was one and one-half times the number of books in each library. This is certainly a good record and shows that the country people will read good books if they are available. The total number of libraries now in use is 111, besides the domestic science books. These are located in 71 counties. Twenty-five applications for libraries are now on file in the secretary's office waiting their turn to be supplied when libraries are returned, and nearly every mail brings requests for application blanks. The wide interest taken in these libraries is due largely to the information disseminated through the "School News" which has generously given space in its columns for a free library department.

For list of places where libraries have been used, see appendix.

ANNUAL REPORT.

The sixth annual report, which should have been in the hands of the people early in the fall, will be ready for distribution in about two weeks. The institute officers are in no way to blame for this annoying delay in completing the report, for they have no jurisdiction over the printing, which is let under the general contract for printing and binding State reports.

The demand for these reports is so great that the last legislature increased the number of copies to be issued from 10,000 to 20,000, and provided that they must be completed on or before Sept. 1 of each year. It is hoped that this last clause can be made effective for the next report.

The reports will be distributed at once on their completion, through the directors, county institute officers, and the secretary's office.

In order that there may be no delay on the part of the institute in compiling the next report, it is requested that all papers, illustrations and portraits intended for publication be forwarded to the secretary's office at once.

We will now be favored by a vocal solo by Miss Sara Williams.

"Lullaby, by Agnes Woodward"

"O That We Two Were Maying"—*Nevin.*

President: Mr. Shamel, of the college of agriculture, will now give you a short address on "Corn Culture," outlining the work he will take up in his morning class.

CORN JUDGING AND BREEDING.

(By A. D. Shamel, Illinois Experiment Station, Urbana, Ill.)

The interest among the corn growers in Illinois, in corn judging and the improvement of the varieties of corn, has been greater this year than any previous year in the history of corn production in this State. This widespread attention is due in most part to the increased yields per acre from planting the improved seed corn.

The corn grower can now plant seed which has been improved by careful selection and breeding. In this selection the per cent of barren stalks has been reduced, the uniformity of size and shape of ears developed, and depth of kernels increased. By breeding, seed has been produced so that when a kernel is planted it will produce a fertile stalk bearing an ear like the parent. This improvement has resulted in increased yield per acre at no extra expense in production to the corn grower. The increased yield has been pure profit. In the case of one farmer in southern Illinois, he secured enough improved seed corn to plant 120 acres in 1901. This field yielded 15 bushels per acre more than any other field on the farm planted from ordinary seed corn of that locality. It was about 25 bushels above the average yield of the county, and the farmer estimated his profit from the improved seed that season at $700.

In another instance a central Illinois farmer selected the best seed corn he could secure and planted 80 acres in 1900. This field gave such favorable results that enough improved seed was secured to plant over 1,000 acres last year. The profits from improved seed in this crop were so great that this farmer has secured over $1,500 worth of improved seed for the coming season and expects to plant the entire field of 12,000 acres from specially selected seed.

The average annual amount of seed corn used in Illinois, is about 1,000,000 bushels. The quality of this seed depends upon the selection made by the farmer, the season, and the soil upon which it is grown. The ordinary method of selecting seed corn is to pick out of the general crib in the spring, just before planting, the ears to be used for seed corn. Little attention has been paid to the purity of color indicating purity of breed, or to the several points which go to make up a good ear of corn. With this system of selection little idea can be gained of the nature of the stalks which produced the ears selected for seed, or the stalks which produced the pollen which fertilized the seed. If some of the stalks which produced this pollen were barren, the seed ears fertilized by such pollen will likely produce plants like both parents, resulting in a number of barren stalks. We know that barren stalks will produce more pollen than stalks bearing ears, so that without breeding the per cent of such barren stalks will likely increase.

In an extensive series of counts made in the corn fields of every county of the State during the last three years, the average per cent of barren stalks has been found to be about 30 per cent. In other words, one out of every three stalks in the corn field is barren, a waste and loss to the corn growers. It has been found by the Experiment Station, and by the corn breeders of Illinois, and other states that by removing the tassels of barren stalks before they produce pollen in the breeding field, so that the seed will be fertilized by the pollen of fertile stalks, that this per cent can be reduced. From the data we have at present, we are able to conclude that this condition of barrenness can be practically done away with.

Since the year 1888, the Illinois Experiment Station has been making careful comparative tests of the yields of the varieties of corn popular in this State. The results of these tests have been to show that the following varieties of corn have produced the average highest yields per acre: Leaming, Reid's Yellow Dent and Boone County White. So marked has been the increase in yield in these varieties over the ordinary varieties grown in this State, and the new high-sounding named varieties put on the market by seed dealers, that this fact caused an investigation of the methods by which the varieties had been produced. It was found that the Leaming corn was named in Ohio, about 1825, by a corn grower of that name located near Wilmington. Some attention was given to the selection and storing the seed of this type of corn in that locality by the originator of this variety. In 1885 this corn was brought to central Illinois, planted on the rich soils of this section of the State, and the seed carefully selected each year. From this farm seed was sent into northern and southern Illinois, and western Indiana. In each case some man began the selection of the seed best adapted to his local conditions of soil and climate with the idea of producing the largest possible yield of valuable feeding corn. In the case of Ried's Yellow Dent, the seed was also brought to Illinois by a farmer in the west central district in 1847. This corn grower has given special attention to the selection of his seed, and the keeping of his type of corn free from mixture with the adjacent corn fields. This man has spent his life in the development and improvement of this corn according to his ideas of what a good type of corn should be. The tracing up of the history of the Boone County White corn showed that it was originated in Indiana by a man who devoted his life to the improvement, by selection, of the white corn common to his section of the State. By careful cultivation, storing of the seed and systematic selection of the type which best filled his idea of good corn, he impressed his ideas on the variety which he produced. In every case the man who developed these varieties of corn was a stock raiser, and in several instances a live stock breeder of wide reputation. The principles used in the improvement of the breeds of live stock were carried to the improvement of the corn which he raised for the feeding of these animals. By keeping part of the land in pasture, conserving and spreading the manure on the corn fields, the fertility of the soil was so kept up on these farms that large yields of well developed ears of corn could be produced.

The reason, then, of the results secured in the comparative tests made by the station, was found in the attention given to the selection of the seed by such men as J. S. Leaming, James Riley, James L. Reid, E. E. Chester, and J. H. Coolidge.

The Illinois Experiment Station has carried on a number of tests during the last few years with the selection of corn and the possibilities of corn breeding. It was found as a result of these tests that the size or height of stalk could be increased or decreased by selecting the seed from large or small, tall or short stalks. The width of the leaves could be increased or decreased by selecting ears from wide or narrow leaves. The length of shank could be increased or decreased by selecting ears with long shanks or short shanks. The size and amount of husks on the ears was increased so that the husks protruded beyond the ear, or reduced so that the husks covered only a part of the ear, by selecting ears with large husks, or ears with small, fine husks. This experimental work was carried to the change in the composition of the kernel. It was found that the per cent of protein could be increased or reduced, the per cent of oil or starch increased or reduced, simply by selecting the ears with large or small amount of oil, starch, or protein. The possibilities in the breeding of corn as shown by these experiments are that the yield per acre can be increased and the value of the crop for feeding, or glucose products, be vastly increased.

So great has this possibility been felt by the men who have taken the initiative in the improvement of the varieties of corn, that they have organized an association for the purpose of assisting the progress of this work. This association is the Illinois Seed Corn Breeders, composed of men who are actually breeding some variety of corn on their farms. During the past half century seed dealers have recognized the value of improved breeds of corn to the farmer, and the consequent popularity of an improved type of seed. They have made attempts to secure this seed in many cases from an honest desire to supply to the corn grower an improved variety of corn. However, in most cases they have had to depend upon corn grown by contract, with no special attention in the selection of the seed, cultivation, or harvest, and so have not accomplished any great permanent improvement. On the other hand, there have been many so-called seed dealers who have actually misrepresented the varieties which they advertise and have worked a great amount of harm to the farmers who bought their seed, and to the entire business of corn breeding. The Corn Breeders' association has begun to systematically record the breeding of their varieties of corn, so that in the future there is no reason why the corn breeder should not be able to offer a pedigree with the corn which he offers for sale.

The method of breeding corn is to carefully select the seed for a small breeding field, usually little larger than an acre in extent. This field should be the best corn land available. Each ear of seed corn is planted in a row or plot by itself. Careful cultivation is given this breeding field. The barren and weak stalks are cut out so that the pollen of these stalks can not fertilize the seed ears. In the fall each row of corn is carefully examined, and the seed for next season's crop selected from the ten rows giving the largest yield, the greatest number of good ears, in other words, the best corn.

By this method the undesirable types are weeded out and the best types retained and improved.

The object of corn judging is to determine the best seed corn, and by the best seed corn is meant that which will yield most corn for the highest quality either for feeding or for market, and is consequently the most profitable to grow. The method consists in comparing the samples of corn with the standard scale of points which is supposed to contain all the qualifications of the best seed corn, viz.: First, those points that insure high quality for consumption, such as soundness, maturity, etc.; second, such as insure good yield, as size, uniformity and shape of ears, well filled butts and tips, per cent of corn, etc.; third, such as insure a perfect stand, as the per cent and vigor of germination; and fourth, if the sample be a pure bred variety, such as trueness to color and type according to the standards of that variety.

These standards are so arranged that a sample which best fills their conditions, will be the best yielding, the most vigorous, and the most profitable corn to grow. On the judging table it is necessary to keep this fact absolutely in mind, viz.: That the judge is not only to compare one sample with another, but each with the standard separately and independently, in order that its own proper ranking may be determined. It is a good practice to keep the scores of the different samples laid out side by side, so that at all times a comparison may easily be made. The score cards and standards of perfection are useful as guides to the careful study of each individual point in the sample of corn. If only the score card is used in an absolute mathematical sense, certain points which cannot be taken into account in the preparation of a score card, interfere with the results and frequently cause a wrong decision; e. g., with the uniformity of exhibit.

In exhibits of corn ten ears usually constitute a sample. This number will make it possible to get a fair idea of the uniformity of the variety, and at the same time it offers a convenient number for calculations in the scoring of the exhibit.

In selecting corn for an exhibit great care should be taken that the individual ears are not injured in any way. By careless dropping an ear part of the kernels may be shelled off or mutilated. This will interfere in determining the per cent of corn on the ear, and leave doubts as to the purity of the color of the grains. Even during the process of judging the ears should be handled as little as possible, consistent with a careful examination of all parts. The ears should be laid down in the same order as taken up. In no case should they be twisted so as to break or injure them.

In judging corn it is necessary to expedite matters as much as possible. All unnecessary moves must be left out. The eye must be trained to accurately judge any one point at the first examination. Ten minutes should be long enough to judge all points, except shelling the corn to determine the per cent of corn on the ear. To get a close comparative study, it is advisable to lay all of the samples of any one class side by side on some convenient table. This table should be of convenient height for working easily and without strain. The light should fall evenly over the entire exhibit, and it is absolutely necessary to have a strong light. Much of the mixture in the kernels can only be detected by the closest observation in the best possible light. In all cases light must fall on the tips. The judging table should be so arranged that one can easily examine the tips of the ears by bending over the table.

Following is the established standards of perfection for the recognized variety of corn:

	Name of Variety.						
	Reid's Yellow Dent.	Golden Eagle.	Riley's Favorite,	Leaming.	Boone County White.	Silver Mine.	White Superior
Ear— Shape	Slowly tapering	Slowly tapering	Slowly tapering	Tapering.	Cylindrical.	Cylindrical.	Slowly tapering
Length	10 in.	9 in.	9 in.	10 in.	10 in.	9 in.	10 in.
Circumference	7 in.	7 in.	7 in.	7 in.	7.5 in.	7 in.	7 in.
Kernel— Condition	Firm upright.	Loose upright.	Firm upright.	Firm upright.	Firm upright.	Firm upright.	Firm upright.
Color	Light yellow.	Deep yellow.	Deep yellow.	Deep yellow.	Pearl white.	Cream white.	Starch white.
Indentation	Medium smooth.	Very rough.	Rough.	Rough.	Rough.	Very rough.	Medium rough.
Shape	Long wedge.	Broad wedge.	Medium wedge.	Medium wedge.	Medium wedge.	Broad wedge.	Very broad wedge.
Rows— Number	18-24	16-20	16-20	16-24	16-22	16-20	18-20
Space	Narrow.	Medium.	Medium.	Medium.	Medium.	Narrow.	Medium.
Arrangement	Pairs.	Distinct	Pairs.	Pairs.	Pairs.	Pairs.	Pairs.
Butt— Filling out	Deeply rounded compressed.	Moderately rounded compressed.	Moderately rounded compressed.	Moderately rounded compressed exp'nd'd	Moderately rounded compressed.	Moderately rounded.	Shallow rounded depres'd
Tip— Filling out	Regular rows of kernels.	Regular rows of kernels.	Regular rows of kernels.	Irreg'lar rows of kernels.	Regular rows of kernels.	Regular rows of kernels.	Regular rows of kernels.
Shank— Size	Small.	Small.	Small.	Medium.	Medium.	Small.	Medium.
Cob— Size	Medium.	Small.	Small.	Medium.	Medium.	Small.	Medium.
Color	Deep red	Deep red	Deep red	Deep red	White.	White.	White.
Per Cent of Corn	88	90	90	88	86	90	88

Following is the table of measurements for each of the above named varieties, and also general exhibits of corn for ready reference in judging:

Name of Variety.	Length of Ear.	Circumference of Ear.	Per Cent of Corn.
Reid's Yellow Dent	10 inches	7 inches	88
Golden Eagle	9 "	7 "	90
Riley's Favorite	9 "	7 "	90
Leaming	10 "	7 "	88
Boone County White	10 "	7.5 "	86
Silver Mine	9 "	7 "	90
White Superior	10 "	7 "	88
General Exhibit	10-11 "	7.5-8 "	88

The score card used in judging all samples according to the above standards, with explanation of points, is as follows:

Points.	Perfect Score.	Explanation.
1. Uniformity of exhibit	10	Uniform type, size, shape, color and indentation
2. Shape of ears	5	Cylindrical, straight rows, proportional length to circumference
3. Color of ears	10	White kernels, white cob; yellow kernels, red cob
4. Market condition	5	Soundness, freedom from injury, maturity..
5. Tips of ears	10	Filled out with regular sized kernels
6. Butts of ears	5	Kernels swelled out about shank regularly..
7. Uniformity of kernels	5	Uniform type, shape, color, etc
8. Shape of kernels	5	Wedge shaped, straight edges
9. Length of ears	10	Conformity to standard
10. Circumference of ears	5	Conformity to standard
11. Space between rows	10	Furrow between rows of kernels
12. Per cent of corn	20	Conformity to standard

UNIFORMITY OF EXHIBIT.

By uniformity is meant uniform size, shape, color, indentation, etc.; in fact all points which go to make up an ear of corn. The ten ears of the sample should possess similar or like characteristics, but the kind of shape or other characteristic is not taken into consideration at this time. The ears should present a uniform appearance. This point is one of the most difficult to be properly estimated. In the beginning actually re-arrange the exhibit, if necessary, and place the uniform ears together. In this way a better idea can be gained of the uniformity of the exhibit and of the value of this point. If, for example, six ears in the exhibit are fairly uniform, and four are distinctly different in general type, a cut of four points should be made. In other words, give the sample a marking of six points. This plan will give a just marking, because, although the six ears may not be absolutely uniform, the four ears are not entirely dissimilar. The shape should be uniformly the same in the different ears of the exhibit. The shape may be very poor, but if the ears are alike they must be counted of uniform shape. The size may be too large, but if all the ears have the same size the exhibit will be uniform and no cut should be made in the score. It is usually an easy matter to divide an exhibit into the uniform and non-uniform ears where there are distinct differences, but the cause of slight differences must be cut according to the best estimate of the judge.

SHAPE OF EARS.

In shape the ear must be true to variety shape. For instance, the shape of the Boone County White ear is cylindrical, while that of the Leaming is slightly tapering. Each variety has individual variety peculiarities of shape.

In general, all ears should be cylindrical, carrying the same circumference from the butt to the tip. This shape will secure uniform sized kernels from butt to tip. Consequently there will be a larger proportion of corn to cob in such cylindrical ears than on very tapering ears. In most tapering ears the taper is caused by the dropping of one or more rows of kernels about one-third the distance from the butt to the tip. These dropped rows cause irregular kernels, a smaller proportion of corn to cob, and a poorly shaped ear. The rows of kernels must be straight and parallel with the cob. If the rows turn to the right or left, or are irregular and crooked, such irregularity must be taken into consideration and a cut made in accordance with the judgment of the judge. In judging shape count the number of well shaped kernels true to variety type in the exhibit, and the number of poorly shaped ears. Cut according to the proportion of poorly shaped ears, e. g., for four poorly shaped ears, cut the exhibit two points.

COLOR OF EARS.

For all recognized varieties a white corn should have a white cob, and a yellow corn a red cob. If the yellow exhibit contains a white, or a white exhibit a red one, it is an evidence of very careless selection, and should bar the exhibit. A yellow kernel on a white ear, or a white kernel on a yellow ear, is an evidence of mixed corn. In other words, in the case of the yellow kernel on the white ear, a stray pollen grain from a yellow variety has fallen on a silk and fertilized a kernel of white corn. Single mixed kernels in an ear show merely accidental mixture, and if the ear is to be used for seed the grain should be removed to prevent it from effecting a further mixture the next year. In looking for mixture the tip and butt of the ear must be closely examined. The young ear ripens silk on the butt first, the middle of the ear next, and the tip last. If the butt silks should ripen so early that the pollen of that variety is not ready to fertilize them, they will either not be filled out or will be fertilized by the pollen of some earlier variety which may be growing in the vicinity. As frequently happens, the tip silks may not appear until the pollen of the variety is gone. In this case the tip may either not be filled out or may be fertilized by pollen of some late variety, thus causing mixture. If the mixture is between yellow and white corn, it can be seen in the yellowish cast of the white kernels, or the whiteish cast of the yellow kernels, particularly in the so-called "White Cap."

For one or two mixed kernels in an ear a cut of .25 point should be made. For three or four mixed kernels cut .55 point; for four or five such kernels cut .75, and for more than five cut 1 point. All missing kernels may be assumed to be mixed kernels; and in exhibits of corn show a cut of .1 point should be made for every missing kernel.

MARKET CONDITION.

By market condition is meant ripeness, soundness, freedom from injury or disease, and brightness of color. In other words, the condition of the ear best adapted for marketing. In corn exhibited in the "show ring," market condition is usually found by the looseness of kernels on the cob. This condition indicates the degree of maturity. In drying out, the kernel shrinks leaving it loose and movable on the cob. In an immature ear the season was not long enough to enable the plant to store the starch, protein, oil, etc., in the kernel to its full capacity. Consequently as the excess of moisture dries out it leaves the walls or coats of the kernels without being fully packed. Such kernels are frequently called "chaffy."

TESTING VITALITY OF SEED CORN.

There is no means of testing the vitality of seed which properly comes under market condition, except by a germination test. In selecting seed corn it is very important that a thorough test of the vitality be made. This can be most easily and satisfactorily done by taking three kernels out of every ear to be tested, one from near the tip, one from the middle and the other from near the butt of the ear. Fill an ordinary plate about two-thirds full of fine sand. Pour water over the sand until it runs off the plate. Tip the plate at an angle of 45 degrees, and allow the water to drain off a few minutes. Now plant the kernels of corn point down in the sand and barely cover with sand. Make a careful count of the kernels put in each plate and keep an accurate record of the number. Now turn a slightly smaller plate over the plate of sand to prevent too rapid evaporation of moisture and set in a warm place. Examine every day and keep the sand moist. At the end of ten days all the kernels should have germinated. Count the kernels that have sprouted and compute the per cent of germinating kernels. In seed corn 97 per cent constitutes perfection in vitality.

In scoring maturity take each ear up carefully and give it a sharp twist. If it is mature it will remain firm and solid. If immature it will twist loosely about in the hand. Count the number of immature ears and cut the exhibit one-half point for every diseased, chaffy, immature ear. For instance, if there are six immature ears cut the exhibit three points, or give it a marking of two on the market condition.

TIPS OF EARS.

The tips of ears should be filled out with regular uniform sized kernels. No portion of the cob should project beyond the kernels. If the cob does extend beyond the kernels it shows that the tip kernels have not been properly developed. As the tip silks mature last on the ear, it is natural that frequently the tip will mature so late that all of the pollen will have gone by the time the silks of the tip kernels are ready to be pollinated. In such cases it will be found that the silks on the tip will keep growing for an abnormal length of time in the effort of the kernels to secure fertilization. In many cases the tip kernels are irregular in size. This is due to partial or irregular development, part of the kernels having been fertilized and part unfertilized, or part of them having been fertilized much later than others. The fertilized kernels swell out into irregular shapes and sizes in an effort to occupy all of the space. If the tip is not fully filled out it is an evidence of some irregularity in development and it should be marked accordingly. For every exposed tip one inch long make a cut of one point. For less exposed tips make smaller cuts, even down to one or two-tenths. In the case of irregular kernels on the tip the judge must mark according to the degree of irregularity. The rows of kernels should extend in straight regular order over the tip.

BUTTS OF EARS.

In the case of the butt the rows of kernels should extend in regular order over the butt and around the shank or ear stalk. When the shank is removed in husking, a regular depression should be left. If the kernels are not filled out about the shank, the shank is usually developed very large and strong. This interferes very seriously in husking as it is very difficult to break off some of the heavy shanks. Not only is this true, but in such cases, the butt of the cob not being fully filled over, there is a smaller proportion of corn to cob. This filling out about the shank can be carried too far, as many other single points may be developed out of due proportion. In one of the standard varieties it is not infrequent that the ears break off in the fall before husking. In other words the shank is not large enough nor strong enough to support the weight of the ear. Upon such examination of such ears the butt will be found to be so completely filled out that the shank has been dwarfed. The shank has been bred so small that in a heavy wind the swinging of the ear back and forth on the stalk breaks the ear off from the shank at the butt. A large butt poorly filled out is usually accompanied by a large cob. This cob will usually be found to be very sappy at the time of harvest. This is a great detriment to the ear of corn, not only in loss of grain but from the fact that such ears are easily affected by changes of temperature. The cold weather freezes the water in the cob and kernel, and thus expands and bursts the cell walls in the germ. This may reduce the vigor or destroy the life of the embryo plant.

In case of the butt the silks occasionally mature so early that there is no pollen ready for the fertilization of the butt kernels, although in most varieties the pollen matures before the silks. Therefore we find a large proportion of good butts more frequently than good tips.

In showing corn it is very desirable to trim out with a knife all traces of the ear stalk. This will add to the appearance of the exhibit in a perfectly legitimate way. In fact, this grooming of the ears should be carefully attended to by the exhibitors, as a little attention will frequently add considerable to the scoring of the exhibit.

The size of the depression in the butt of an ear will depend on the variety. In a large variety, as Boone County White, it will be larger than in a smaller variety, as Riley's Favorite. This characteristic must be taken into account by the judge through familiarity with the breeds of corn.

In scoring butts a very poorly filled butt in which the kernels do not cover the end of the cob should be cut .5 of a point. If the kernels cover the cob, but are flat, shallow and irregular, cut .3 of a point. If the kernels are regular in size but do not swell out beyond the cob, cut .2 of a point. In the case of kernels swelling out beyond the cob in an irregular manner cut 1-10 of a point. If the kernels are swelled about the shank in regular manner, leaving concave depression, give full marking.

UNIFORMITY OF KERNELS.

The shape of the kernel will depend somewhat on the variety. Whatever the shape of the kernel in an exhibit, it should be uniform. The size of the kernel should be the same in all of the ears. To examine kernel uniformity take out two kernels with a knife from each ear about one-third the distance from the butt to the tip. Lay them directly in front of the ear with the tip of kernel pointing toward the ear. In this position the comparative shape, size, etc., can easily be noted by the judge. The judge should note the ears to see if the kernels are uniform in all parts of the ear. For instance, if the ears are rough, note that all the kernels are rough, or vice versa. A rough kernel usually indicates a deep kernel. In dent corn the tip of the kernel is first packed with food for the use of the young plant and matures first. As the season advances the rest of the kernels fill and mature. The seed coats of the kernel are developed far in advance of the development of the food in the kernel. As the grain approaches maturity the kernel dries, hardens and contracts and the seed coat at the top of the kernel is drawn down into stored up food. This is the cause of indentation. The deeper the dent, the greater has been the possibilities of development of the depth of length of the kernel.

Count the number of ears having generally uniform kernels and mark in proportion to the number of uniform kernels. For instance, if there are five sets of uniform kernels, and the ears from which the samples were taken have uniform kernels, mark the sample 2.5 points for uniformity of kernels. Of course the five ears that have been counted as uniform will not be absolutely uniform, neither will the other five ears be non-uniform, and the proportion will about average up the true value of the sample on this point.

SHAPES OF KERNELS.

The shape of the kernel will vary with the variety. However, in general, the kernels should be wedge-shaped. This wedge-shape permits the greatest possible amount of grain to cob. The tips of the kernels are set on the cob in regular manner. In order for the rows of kernels to fit snugly together from the point to the crown it is necessary to have a wedge-shape. It is also necessary that the edges of the kernels be straight. Otherwise the middle of the kernels would touch and there would be furrows or spaces between the tops of the rows. This is so true in practice that we find ordinarily in the wedge-shaped kernels that there is from 18 to 24 rows of kernels on the cob. But in the case of broad, rectangular kernels or kernels with rounded edges we find from 12 to 18 rows of kernels. In other words, with the wedge-shaped kernels the greatest proportion of corn to cob is found.

In judging shape of kernel, count the number of wedge-shaped kernels in the ten pairs that have been taken out for study of uniformity. Mark according to the proportion of well shaped kernels. For instance, if there are eight pairs of properly shaped kernels, mark the exhibit four points on shape of kernels.

LENGTH OF EARS.

The deficiency and excess in length of all ears not conforming to the standard for the variety should be added together, and for every inch thus obtained a cut of .5 point should be made. In determining length measure from the extreme tip to the extreme butt. In measuring length it is most convenient to hold a foot ruler in both hands, one end even with the butt and the other end over the tip. As the ruler is drawn from ear to ear on the sample, it is an easy matter to keep in mind the amount each ear is shorter or longer than standard. Add the excess and deficiency together.

CIRCUMFERENCE OF EARS.

The excess and deficiency of all ears not conforming to variety standard should be added together, and for every inch thus obtained a cut of .25 point should be made. In measuring the circumference use a tape line. Measure the circumference at about one-third the distance from the butt to the tip of the ear. In order to do this conveniently and with the least possible loss of time pick up the ear in the left hand. Hold the end of the tape line on the ear with the index finger of the left hand at the necessary point. Now quickly wrap the tape about the ear and note the measurement, adding together the excess, or the lack of proper circumference for each ear, and cut according to rule.

SPACE BETWEEN ROWS.

The space between rows is the furrows between the top of the rows of kernels. It is usually greatest in a broad, shallow kernel or a smooth kernel type of corn. To determine the cut for space the following rules can be applied if tempered with the judgment of the scorer: For less than 1-32 inch, no cut; for a furrow 1-32—1:16 inch in width, one half point cut; for more than 1:16 inch, cut one point for each ear. This space between rows is a relic of the early type of Indian corn. It indicates a reversion to the unimproved varieties, and is very undesirable. It is usually accompanied with a comparatively small number of rows of kernels on the cob, and consequently a small proportion of corn to cob.

PER CENT OF CORN.

The proportion of corn to cob is determined by using every other ear in the sample. Subtract the weight of cob from the weight of ears, and the weight of the grain will be obtained. Divide the weight of the grain by the total weight of the five ears, and the percent of corn will be obtained. For every per cent short of standing cut five points.

The proportion of corn to cob depends in part on the maturity of the ears. If the ears are thoroughly dried out, the percentage will be greater than in moist ears.

Mrs. Dunlap will give a little outline of the work in domestic Science that will be carried on at the Nelson hotel each morning during the institute.

Ladies and Gentlemen;- I really never expected to find a man that would excel a woman in talking. but whenever I try to follow Mr. Shamel I find it is impossible to keep pace with him. So you must not expect it; my desire may be equally as great, but I have not the ability, It is certainly with a feeling of great pride and gratitude that I speak to you a few words this afternoon in regard to the subject of "Domestic Science." Feeling of pride because it is right to possess them when we know that our State stands first in the Union in regard to the work that she has accomplished in domestic science, and that means the science of the home, the making of home life more comfortable, better and happier. Six years ago this Farmers' Institute extended the privilege to the woman of the State to appear upon their programs touching upon this subject of domestic science. That was in Springfield. The next year you also gave them the privilege to say a word in regard to it, but the next year nothing was said. A little later on you made the suggestion to the woman that we form an organization similiar in purpose to that of the Farmers' Institute and that we become affiliated with you in this great work of uplifting our homes and making our State better in every respect. We very gladly undertook to work without many dollars, but I will tell you about that later on, and the result to-day is that we have over 70 counties organized in domestic science in this State. This organization helped to increase the senttment throughout the State, so that when we asked that a domestic science department be placed in our State university it was granted, and the domestic science is now on the curriculm of our State university. Then we were getting accustomed to asking for things, so we asked for a girl in every county in this state to go to the university and to have the privilege to domestic science work. That has been granted now, and to-day every county organized has the privilege of sending a girl to the State University with a free scholarship. Then again we kept thinking of something else and through this organization we asked last year the trusteese if our universities would grant to the housekeepers of this state a two weeks course in household science. It was granted, and I wish to say to you that we held our first housekeepers conferenc the last two weeks in January and its success far exceeded our greatest expectation.

Now it was through this organization that the idea first started to have a woman's building on the State fair grounds, and through the organization force of some of the members of this Farmers' Institute and through the kindness of our legislature, only we don't feel a very liberal kindness, we at last succeed in having a woman's building upon our State fair grounds, the first known in the United States, and the design was to take a girl from every county in the State and have them go down and enter into this woman's building and have it as a home for three weeks during the year. We should give a through course in domestic science. Uufortnnately-perhaps you may say fortunately our building was destroyed by fire this last fall, but we hope that through your influence and through the influence of every good citizen in this place that that building will be re-built and that we may not have to wait two or three years for this good work to go forward.

Now my feelings of pride are second to those of gratitute. Gratitude to the officers and directors and the members of this Farmers' Institute for what they have done for the women and the homes of this State. Gratitude to those who had the institute close at heart, who were at the head at the time when this organization was started, and the names of Chas. F. Mills and Coleman and Davenport will go down in history in the hearts of women and the minds of the women of this State for the good work they did for us. I cannot say too much in gratitude for the work of Mrs. Carter and Mrs. Blair as president and secretary of this organization. The work has been much beyond our expectation. I have not told you what we have done. We are not through asking yet. We are just beginning to get accustomed to it and are going right on until we have domestic science taught in every public school in this State, until—I should have said first in our normal schools, and then it will go broadcast throughout the State. Too long have we neglected the manual arts of our girls and today it was an effort to get domestic science placed in our university. They want to know the art of dressmaking. It is an art. We want them to have the privilege of learning how to make their own hats just as well as the boys who learn to cut the wood up to make the furniture. Is it not important for our girls to know how to make clothes, becoming for her body, and shall we not secure places for the training of our girls and our boys. This is the trend of the age and well it should be.

Another thing this institute has given freely, I say freely of the amount that has been appropriated to them, to aid us in this work, and had it not been for their generosity we could never have accomplished what we have, but we feel we are upon our feet, we have demonstrated to every law maker that we are in earnest, and that we will take the money entrusted to our care and spend it carefully and wisely, and I believe we are now in that position where we should have an appropriation that is ours and with which we can develope this work along the lines we wish it developed. Not but what we appreciate what you have done for us, but we want you to get every dollar you need for your work, and we want a few more dollars for our own work.

As you will see there is yet a great work for us to do and it is such things as this organization of farmers and of the home working in harmony and in good-will that it can be accomplished. Whenever you make a home better in any community you have lessened crime and lessened disease, and so I ask of you to lend your influence and aid us in this great work.

We are to have a few classes in the morning and I can only speak for one morning. I am not like Mr. Shamel who is at the head of his department, because the officers of our association tried to do the best we could, but we will have something for the women each morning at the same time the men have ther classes. Tomorrow morning the subject of the work will be on "The Cooking of Eggs." This will be in a very simple way, of course, as we have not the appliances to do very much, but after we have cooked the eggs we will discuss the cooking of the albumen. Mrs. Carter will talk to you on "Household Conveniences," which will be of value, and Mrs. King on "The Value of Sunlight." In the discussions of these matters we can get closer together. I hope every woman here will feel welcome to attend and perhaps they can gain a little from what may be said. I do not feel that I am capable to illustrate and demonstrate, but I am going to talk to you in as simple a way as possible of what I have learned to be the truth in my own experience, in my own home.

PRESIDENT: Are men barred from that meeting? A. Not if they will go home and cook the eggs.

MR. LOVEJOY: In regard to the woman's building I wish to say that we had an insurance of $8,000, which was paid, and we have the money set aside ready for the ladies whenever they want it.

PRESIDENT: You will need no introduction to Mr. Blair. He will now outline the work for the week.

CLASS IN HORTICULTURE.

LADIES AND GENTLEMEN:- In talking to an audience on the subject of horticulture I find that often very many people do not have a clear notion of what constitutes the subject. With your permission at the outset them, in order that we will lead up in a logical manner to the work before us in these different morning classes, I wish to ask your attention this afternoon to a few simple phrases we use every day of our lives and which are common property to us.

Horticulture in its broadest sense means the cultivation of the garden and that gives us then the first idea of where horticulture primarily differs from agricultural. Let us follow along down, if you please, these terms one after another. In its broadest sense agriculture is the business of raising products animals and plants from the land. In this larger way the subject includes horticulture, forestry, dairy, the farm crops and animal husbendry, but in the more restricted sense agriculture has come to be co-ordinate with forestry and horticulture. This is best explained in this way.

Agriculture comes from the old Latin word agri or agre, a field and the other cultora, to cultivate, so we have agriculture which means the cultivation of a field. Horticulture comes from the word hortis-garden, and so horticulture means the cultivation of the garden. We find that as a result of custom that horticulture embraces larger territory than we usually think of a garden, so we use the term garden to denote the restricted garden. So we may use the term garden to denote the restricted territory, while the term horticulture itself may denote either a small area or larger. Agriculture, therefore, as it is commonly used today, means the raising of animals and products for other needs and supplies and in supplying us throrgh foresty with wood for our supplies, protection and luxury.

We find, therefore, when we come to analyze our subject, we have a field embracing a wide range of thought, more than perhaps we would first think. We find the subject so broad that we make another division for the sake of our work and for the sake of surrounding our subject.

The subdivisions of horticulture are, Pomology (Growing Fruits), Orchard Fruits, Small Fruits, Vine Fruits.

Our first lesson will be confined to this first subdivision or a certain portion of it. We hope to take up some phase of this work first as applied to pomology.

We have a second division of Vegetable Growing, the raising of vegetables for kitchen and market gardens, and that is the subject to which I will invite your attention on Thursday morning, the subject of the vegetable.

The third division is Flora Culture, one of the biggest and most important branches.

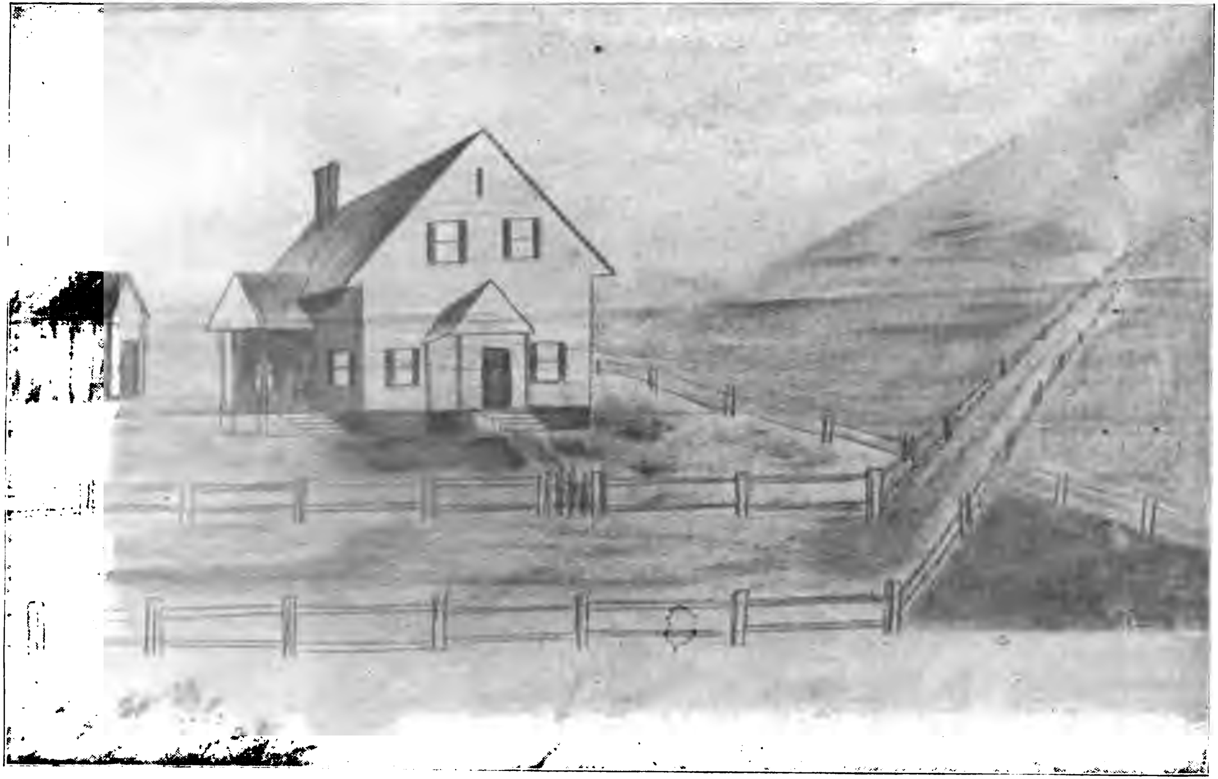
Landscape, or Landscape Gardening. We hope at the last session to cover partly some things on this subject. The growing of the shrubs and trees in the home.

In the different types of horticulture we find the amateur grows the plants he likes, growing them for himself and the immediate home life; and in the other great type we have the commercial man who grows what the market demands, growing for others and to make money. The type of horticulture we will discuss in our work will be horticulture from the farmer's standpoint. I take the position that every farmer in this great State of Illinois should grow his own fruit, should plant those flowers, ornamental trees and shrubs he likes, so that he can term himself a horticulturalist.

In our last session, the one we will have Friday morning, it will not be possible to cover the entire ground in that class, and by the way I want to leave this thought with you, so as not to come to the class with a mistaken idea, I do not intend to give lectures. I will talk for ten minutes and it then will be a discussion for everyone.

We have two types of American homes. If you go up and down the broad State of Illinois, there are two classes of homes; one standing bare and bleak, not surrounded by any trees or shrubs. It is cold, cheerless, and an uninviting place. It is not a home; simply a house standing by itself. Do you blame the boys and girls for leaving such a place? What can we do to keep the boys and girls at home? We have got the answer right there more than in any other place.

A little nature has been brought into this picture; the home grounds have been made restful and attractive. The boys love to throw themselves on the grass under a shade tree, they love to recline in the hammock under the trees after a hard day's work; but what about the boy in such a place as this? Could our boys and girls of Illinois have homes like these, the attractions of the city—the saloon would have no charms for them. There is nothing stronger than the tie of a happy home life, the memory of a restful, cheerful abiding place. Let us no longer think that this is a matter that must be left with the moneyed people, because it is for the man who has neither time, leisure or luxury, as well as it is for the rich. And any farmer can well afford to spend a little time to make the grounds a little more attractive. Keep the center of the grounds free and open, fill in and around the background. Do not cut up the lawn with the flower bed, which is unsightly the greater portion of the year. Mass the flowers at the side of the lawn. Do not have a scattered effect. The place for the flowers is right along the border of the walk or back in against some low bushy shrub and the shrub in against some trees or large growing plants. I insist that we pay more



attention to the beautifying of our home grounds. There is no better way to keep our boys at home than to put there something that will appeal to them. We have reached the point where we must give more attention to the beautifying of our grounds, and I wish to thank the officers of the Farmers' Institute for bringing the subject in on our programs. It has been neglected long enough.

President: "Outline of Work on Live Stock," by Professor Mumford. We expect great things from the college work under Professor Mumford.

SHORT ADDRESS ON LIVE STOCK.

[Introducing class work for week. By Herbert W. Mumford, Professor of Animal Husbandry, University of Illinois.

MR. PRESIDENT, LADIES AND GENTLEMEN—I feel that I am particularly favored in being permitted to call attention to our class work in live stock husbandry, which occurs each morning as noted in the program. While I am not a product of Illinois, and while I have been among you only a few months, I am delighted with her people and impressed with her agricultural wealth and resources.

It would be an unwarranted criticism upon Illinois intellect to say that Illinois is a State of undiscovered resources, but I believe I am fully warranted in saying that the possibilities of Illinois agriculture are not fully appreciated by her people. With land rapidly increasing in value, we are apt to turn our eyes toward cheaper lands with a feeling that perhaps it is an open question whether Illinois farms at their present values will continue to return a fair interest on the investment to their owners. High prices for *good land*, conditions existing in every county in Illinois, so far as I am informed, do not necessarily mean that feeders and breeders of live stock must seek homes and profits in some far off, isolated State, where land is cheap. High prices for land do mean better methods. In some cases intensive methods must take the place of extensive.

Extensive methods of farm practice will never be universally replaced by intensive methods until the latter is shown to be more profitable and satisfactory than the former.

We like to see a people who change practice to meet changed conditions, rather than one which feels obliged to change their geographical location in order to place themselves under conditions which proved profitable in an early day.

Permanency of home, of public institutions, and of State, have been fostered and sustained by men who have "stuck to the ship." No need, then, of a general exodus from Illinois to elsewhere cheap lands. If lands are high, there are men enough, there is wealth and intellect enough on the farms of Illinois to still farther enhance their value. All that is needed is for every farmer to suit his farm practice to the changed and changing conditions. Adopt the best methods as they become known, for we have but little definite knowledge as to the best agricultural practice, either concerning agronomy, dairying, or animal husbandry, as compared with the unsettled questions. We must look to the opportunities afforded by our farmers' institutes, your College of Agriculture and Experiment Station, and the more progressive stockmen and grain growers of the State to work out these intricate and far reaching problems.

Never will agriculture cease to be the leading industry of a great State like Illinois, where corn and cattle, hogs and bluegrass are as natural products of the land as are cotton and pickaninnies of the Southern states.

We think that the superintendent of institutes and the program committee have made a very happy selection of topics to be discussed in the morning classes; a difficulty will be experienced, however, by many who feel that they would like to attend more than one of the classes. The man who is studying the best methods of selecting and raising seed corn would perhaps like to drop into the live stock classes and get the ideas of practical stockmen as to the best methods of disposing of surplus and inferior seed, and every farmer should attend the classes in horticulture, since if a man is not making fruit his profit-yielding crop, he is still interested to know how he can best supply his table with the choicest fruits and vegetables. Lastly, farmers and all should study domestic science, for after all is said, the very best crop of the farm is the boys and girls who are reared there. A shame it is to know less of the pedigrees of our children—of the methods of nourishing them to secure proper physical and intellectual development, than we do of our cattle. If ever I envy a man it is he who has the gift to stand before an audience of this character and inspire the men and women of the farm with the opportunities for child culture afforded by the farms of this country. I trust you will pardon me for this seeming digression from my subject. High prices for land do not necessarilly mean insecure profits from keeping live stock. Beef is produced at a profit upon land in England which rents for $15 per acre per year and it sells for only twice as much as the best beef produced in this country. While it is often said that we can produce as good beef in the United States as they can in Great Britain we *do not* produce as good an average quality of beef. We produce too much ordinary and inferior live stock. We must produce a better average article if we expect to secure a profit from our high priced lands. High priced lands mean then, better quality in the finished product, and the fortunate thing for us is that only the finest quality can be produced on the best land. The sweetest, tenderest beef is produced on the best land.

A "Cattle King" of the southwest recently remarked in substance, that present conditions all point to the fact that ranching sections will always be obliged to look to the breeders of the central west to supply pure bred stock for maintaining high quality in the herds of the ranch. And that calves produced on the ranch must eventually find their way to the feed lots of the central west where "Corn is King" and the greatest live stock market of the world—Chicago—within easy access. It is worth while to stop and consider that the farmers, nor any other class, of any other state have contributed so much to make Chicago what she is today, as have the stockmen and grain growers of Illinois. And to no other source can she look with so great confidence for the promise of future commercial wealth and welfare.

I confidently believe that no other state in the Union and no other country on earth is as favored by nature, as to climate, soil and location as Illinois.

I trust I have succeeded in interesting you in what I am pleased to call the great natural advantages possessed by Illinois as a live stock State. We shall be more than pleased by having you present at our morning classes.

TUESDAY, Evening 7:30.

Music—Quartette from Riguletto—(Verdi.) Mrs. Maud F. Bollman, Mr. Myron E. Barnes, Mrs. Daisy Force Scott, Mr. Charles Olson.

We will reverse the program this evening and have the address of Mr. Joseph Carter of Champaign on "The Up-to-Date Farmer" first:

"THE UP-TO-DATE FARMER."

(By Joseph Carter, Champaign, Ill.)

When your committee asked me to read a paper on this occasion they assigned me this topic—"The Up-to-Date Farmer." I do not know what they mean by "Up-to-Date" when applied to a farmer. I know what it means when applied to farm machinery, and to farm animals—it means a plow that will scour; a planter that will drop at every click; a horse that will pull: a cow that will give milk with a high per cent of butter fat; a steer that will put on weight, and where it will be of most value, and in general the term "Up-to-Date" means the best of its kind. I presume your committee expects me to use this standard in measuring their farmer.

The first point to notice in our farmer is the attitude of his mind toward his vocation. Is he ashamed of being a farmer? If he is, let him quit at once and go to banking, or run for congress, or do any other thing that comes along; he will not succeed as a farmer—he is not "Up-to-Date." Is he ashamed of the clothes suitable to his work on the farm? Then let him desert immediately, for no soldier ever won a battle who was ashamed of his uniform. Our "Up-to-Date" farmer feels that his vocation is as honorable as it is important. He knows that it is the farmers who make a country great and prosperous. He knows that they are the people who feed the world—who furnish bread for the mighty millions of earth. He knows that when these are prosperous men laugh as they toil, women sing at their work, and laughing, happy children grow into robust manhood and womanhood. He knows that when farmers are prosperous long railroad trains cross the continent laden with the products of their toil, and mighty ships plow the briny deep as they transport them to the hungry people of other lands. He knows that when these are prosperous thousands of factories give employment to millions of men whose wages build happy homes and opulent cities.

The up-to-date farmer knows that if he were to cease his work the myriad streams of commerce would stop their beneficent flow, ships would rot at their docks, and locomotives rust in their round houses, the hum of the factory would cease, the walls of cities crumble, and the land would return to its original condition of desolation.

The world empires have risen only where food was abundant, and when it has failed barbarism has returned to the land.

As Atlas supported the world upon his shoulders so does the farmer of every land maintain its prosperity.

The farmer changes the *balance* of *trade*, and the wealth of all the world flows to the country whose farmers are prosperous.

Nearly a thousand million dollars worth of farm products exported for each of the last four years is what is making this the richest of all lands.

NO UP-TO-DATE FARMER NEED BE ASHAMED OF HIS VOCATION.

The up-to-date farmer knows the value of being up-to-date. He knows that new discoveries in the various sciences related to agriculture reveal new relations and suggest better methods. He knows that many of the theories held, and many of the methods practiced a few years ago, and some even now, are valueless. He knows that one man can not try as many experiments as can a thousand men, and he knows that the years of one farmer's life are few as compared with the years of all the farmers since the days of Abel, and so he becomes a student. He reads books on farming. He does not scoff at the book-farmer, nor does he refuse to listen to the college professor—for while he has great respect for those who are students of agriculture, yet he knows that the time has not come nor ever can come "when agriculture shall be reduced to a rigid science, which shall be governed by a code of rules and laws as are such sciences as chemistry, physics and the like." He knows, happily, that there is one vocation in which men engage which can never be bounded by methods nor tied fast by precedents—one occupation which is as elastic and untrammeled and as unconventional as the blowing of the wind, the falling of the shower and the singing of the birds. He knows that farming is a business and an art founded upon the interrelation of many sciences, of which chemistry, botany, physiology, physics, bacteriology and climatology are chief. He knows that these sciences and also others, and likewise good business methods must be coördinated by wise judgment and skillful management to accomplish success in farming. Too well he knows that "The best laid plans of mice and men gang aft agee." And so he is a modest man. A philosopher who seeks wisdom from all sources and thinks upon it, and applies it if at all in his own way.

The "Up-to-Date Farmer" subscribes and pays his subscription, too—for those stock papers, farm papers, dairy papers, garden papers, and horticultural papers which treat of the matters in which his business interests lie. His name is on the list at Washington of those to whom Director True sends the publications of the Department of Agriculture, and also on the list at the University of Illinois for its bulletins and announcements. He attends the various county and State institutes and associations both to hear the experiences of others and to tell his own, and also that he may make acquaintances among the farmers of the State. Thus he overcomes the effect of his, more or less isolated life upon the farm; thus he gets new zeal for his vocation, and added wisdom and energy to push forward his various entertprises to greater success.

The "Up-to-Date Farmer" keeps no unprofitable stock. No scrubs are on his farm, $100-an-acre-land will not permit them, he knows. His hired men do not waste their time following a team that can do anything less than a full team's work. His steers and his hogs all pay well for all the food he gives them—none of them eat their heads off, nor eat his head off. He knows a steer that is not a good feeder, and he lets some other man waste feed upon him. He tests his cows, and only those that can be kept with a profit can lie down in his green pastures. Nor will he permit his wife to keep a flock of non-descript, flying, scratching, green-legged, black-skinned hens, even if her mother did give her the seed. He cannot bear the disgrace of it.

Of course the "Up-to-Date Farmer" has the latest improved farming implements, and to save horse power and, to do most efficient work, always keeps them in perfect order. He does not use a plow that will not scour, nor one that is dull, nor one whose adjestment is such that three horses must work hard to do the work which two horses could easily do with a plow properly adjusted. He understands the application of force to all his farm machinery so that the greatest amount of work is accomplished with the least expenditure of power.

When his farm implements are not in use he keeps them housed if it is profitable to do so—a $100 wagon shed into which a $25 farm wagon is backed by hand every time the team is unhitched is not profitable.

And when any machine is worn out and worthless, he sells it to the junk dealer, or hauls it back out of sight so that when his unsophisticated town friend passes he will not see it and rail at the farmer for letting valuable farm machinery be destroyed by the weather.

The up-to-date farmer pays his debts. One of the debts which he does not forget is the one he owes to the soil. He knows that each crop which the soil yields takes from it something of its fertility, and that unless this fertility is returned to the soil, it soon can yield only a diminished crop. So he is very careful year by year to pay back to his land that fertility which the crops have taken from it. He knows many ways of doing this, and the one which he will adopt will depend upon his neighborhood. If he lives in this end of the State of course he will have a dairy farm and sell butter and cheese to all the world and milk to Rockford and Chicago. For he knows that to sell off a ton of butter worth $500, will impoverish his farm no more than to sell off 400 pounds of straw which brings him 20 cents when sold at $1 a load, which is not an uncommon price for straw in many parts of Illinois.

He will keep his hired help all the year, and year after year, for the longer they are in his employ the more valuable they are to him, and the more he can afford to pay them.

He will buy more plant food than he sells—will raise all the feed he can for his stock, and will not hesitate to buy more when needed—bran from Minnesota, corn from Nebraska.

If he is wise in the management of the fertilizers from his barnes and feed lots, and wise in their distribution upon his meadows and pastures, and wise in sowing clovers for his corn-land and among the grasses of his farm, he will in time greatly increase its fertility.

There must be farms in Winnebago and adjoining counties whose productive value is double what it was 25 years ago, and whose productivity is capable of being again doubled.

Farther south—down in the great corn belt—the up-to-date farmer does not keep a dairy. The right species of microbe to ripen the cream does not seem to inhabit there, nor the one that ripens the cheese, or if they are there the farmers haven't got them hitched up yet, and broken in. Besides this, there is no one to do the milking. The man who husks 100 bushels of corn a day can not milk well. One whose physical organism is adjusted to the corn husking movement can not tone himself down to the gentle and placid motion required for most successful milking. And yet he must keep cows. I presume Brother Kerrick has many cows, and they are milked too—but by the calves. Some of these calves are good milkers—they easily milk two cows and do not get tired at it either.

There the farmer must trust to a rotation of corn, oats and clover, feeding part of his grain, but selling much, and raising horses, cattle and hogs for the market. He husbands all the fertilizers of his farm and applies them wisely. Farms there are in that belt that are more productive now than when the virgin sod of the primeval prairies was first broken up.

Farther south, away off there where the north star is five degrees lower than it is here, the up-to-date farmer is confronted by different and more difficult propositions, those calling for more wisdom and higher skill, possibly, than is generally supposed. There grow the lucious and valuable fruits which appear destined ere long to make Egypt the garden spot of the Mississippi valley—and some even say of the world, for they hope soon to ship apples to Europe. And you know it is said that southern Illinois is the best apple region of the world. Many other fruits—peaches, pears and strawberries—are grown there, which are worthy of high consideration. There the up-to-date farmer, too, will care for the ground—how to enrich it so as to add to its fruitfulness. He will not expect that year after year he can let his cattle use the fruit trees in the spring for rubbing posts, get a crop of hay in the summer and a crop of "No. 1" apples in the autum, all from the same orchard. He will know better than that.

He will be a botanist, understanding the structure of the plant and of its bud and blossom; for from these come the fruit, and here, frequently, is the beginning, sometimes a year in advance, of the destsuction of his crop. He must also be an entomologist—an insect sharp—of high degree. He must have an intimate acquaintance—a fighting acquaintance at least—with a considerable number of insect enemies of his orchard and garden. He must know how to "shoo" off these pests, and how to minimize their injury, if they succeed in making a lodgment.

Also he must know how much his crop is worth, lest, after it is raised, some apple-buying, cold storage sharp from New York comes along and cheats him of half, or two-thirds, its value. Or, if he concludes to market his crop himself he must know how to gather it, and how to pack it, and he must mark his packages honestly, so that the future buyer will not think his fruit was hand-picked with a club or a long pole.

But wherever he lives, north or south or in the center of the State, there are characteristics—earmarks, so to speak—by which the farm of an up-to-date farmer is quickly recognized. It has a tidy, well kept appearance; the fences are in order, trees are well trimmed; it doesn't look as if the owner were dead and the administrator has not yet been appointed. The gates are on their hinges and swing free, so that a man can open them without breaking his back, or the third commandment. There are no weeds by the roadside, neither burdocks, nor "Jimson," nor May weed, nor dog fennel, nor mallow, nor any plants but those which some domestic animal will eat, and these are always kept closely cut. Weeds by the roadside and in the corners of his house and barn lots, are as disreputable out of doors as are mice and vermin in the house, and quite as unprofitable, and can be as easily exterminated. The doors of his barns are hooked, shut or open; they are never left swinging. There are some horses that a slamming door will nearly set crazy. His animals are never calling for water, nor his windmill for oil. All about the place everything, inanimate and animate, seems to say, "There is no place like home." Such a farm is a benefaction to the neighborhood and a benediction to its occupants.

Inside the house, even before the first glance one can tell what degree of up-to-dateness the farmer has reached. There will be no odors of vegetables or of fruits coming from their storage places, but the air within the house will be as pure as the air without. The house throughout will be warmed and ventilated by a heating plant in the basement. Every room will be light and airy. Light is the best bacteriacide. The kitchen will be near to the diningroom and the pantry, and will be arranged to save steps. It will be small, to save steps also, and so the hired men will not sit around in the way—for them a warmed and ventilated and suitably furnished room will be provided elsewhere. The kitchen will have all the modern appliances and conveniences, including plumbing, and the like. The up-to-date farmer will see that his wife and his daughters have as convenient and as nice a kitchen to work in as has the *foreign, or colored domestic*, in the modern town house.

In this house of the up-to-date farmer there is that which we have not yet reached—the spiritual life, the soul of the family. This finds expression in the furnishing, the decoration, the art and the literature of the home. This, of course, all belongs to the wife; and it is the duty of the up-to-date farmer to provide her, willingly and joyously, with the means to work out those ideals which were born with her, which grew in her young womanhood, budded when she plighted to him her troth, and which now he should permit to blossom forth into that sweetest and holiest of all places—a true home—a place where peace and prosperity can grow together into a truly spiritual happiness. Without this the house is only a barracks, with it, it is heaven.

The up-to-date farmer will look after the education of his children. Because he believes farming is the most useful and most honorable of all vocations, because its rewards, though rarely extravagant, are yet more certain than those of any other calling, and because they so nearly answer the prayer, "Give me neither poverty nor riches, lest I be full and deny Thee and say, 'Who is the Lord?' or lest I be poor and steal, and take the name of my God in vain;" because of these things the up-to-date farmer will hope and plan for his children to make their future home upon the farm. With this end in view, and knowing how powerful is the influence of the school upon the later life of the pupil, he will desire to have some changes made in the schools.

The first thing he will desire to change is the general organization of the school district. The unit of organization now is so small that it is insignificant; a larger unit should be organized. I believe this matter will be solved by adopting the plan of "Centralization of country schools," which has been thoroughly investigated, and will, on tomorrow evening, be ably presented here by the earnest and efficient superintendent of schools of this county.

This plan of centralization has the hearty endorsement of the leading educators of this State, and it should receive the earnest consideration and the hearty endorsement of every up-to-date farmer. But whether he favors centralization or not, this he ought to do: He ought to ask for two changes in the school law. 1. Each teacher in the rural schools, in order to obtain a first grade certificate, should pass an examination in the principles of agriculture and the domestic arts, just as she is now required to pass one in botany, zoölogy, physics and the effects of alcohol and tobacco on the human system. 2. The law should require the teaching of these additional subjects in the rural schools, just as now it requires the teaching of the effects of alcohol and tobacco.

Let these additions be made to the school law and to go into effect three or four years hence, and by that time our five normal schools and the 101 county superintendents, by their summer institutes, would have a great many teachers ready for this work, and the up-to-date farmer will see to it that one of these is employed in his district.

"The Up-to-Date Farmer" knows that there is no end to the good which a competent teacher can do in teaching how to "keep house" if only she is permitted to do such teaching; and only those who have seen it done can know with what zeal the youngsters take such lessons.

Is not it passing strange that while all of us know that the only foretaste we ever shall get of Heaven, here upon this earth, will be in the enjoyment of a good and well ordered home—for that is what Heaven means—and yet in all the teaching we do at school none of it relates to home-making—to house-keeping? Let the "Up-to-Date Farmer" see that this is changed.

When the spring comes the school of the "Up-to-Date Farmer's" children will have a garden. In this garden the various vegetables and smaller fruits can be raised, and in addition the larger fruits also—apples, plums, pears and the like. Here can be learned not only methods of cultivation, but many things that pertain to the growth of plants our food plants, corn, oats and clover, as how they grow, whence comes the material for their growth; also the uses to the plant of of its various parts—as of root, and stem, and leaf, and tendril and flower. The names of the various parts of the flower should be known to the child as well as are the names of the features of his own face, and likewise their uses, and the scientific name is as easily learned as any other, and no other should be used. The reasons why insects visit plants, and what insects are injurious and what are beneficial should be taught.

This little plat of ground can easily be made a laboratory where most delightful experiments can be made and where knowledge can be gained at first hand, which is the way the "Up-to-Date Farmer" gets most of his. Here the soil can be studied—the affects of cultivation upon it—how water affects it—what plants enrich, and what plants impoverish it. For all this teaching suitable books are abundant and the "Up-to-Date Farmer" will see that his school and his children have them.

There are other lessons in our school garden. The birds will be there; let the children watch them, learn their songs and know their names—where they build their nests, and get their food, and how they feed their young. Bird books are abundant, and teacher and pupil should learn how to use them.

For the larger boys and girls the garden has more advanced lessons and work where greater dexterity is required. Let them learn not only of corn and plant breeding generally, but also of budding and grafting, and other methods by which a new and desirable variety of fruit is propagated and distributed. Tell them the story of how the Wilson strawberry, or the Rhode Island greening has been spread over the continent No story in fiction is more marvelous than the story of the Sudduth pear; nor any fairy tale more interesting than the story of the seedless orange. Tell them to the children of the up-to-date farmer.

The up-to-date farmer desires that his children be warned of the great danger that threatens all our plants—food plants and ornamental plants alike—from the constantly and rapidly increasing ravages of insects. They require the vigilant watchfulness of our ablest experts. They have already changed much of the agriculture of this State, reduced the value of land in some counties and shifted the centers of population in some sections. Let the children learn of flies and how they endanger our health; how disease is spread by them. Tell them of the danger there is to us from mosquitos, and how we may exterminate them. Tell them of the greatest glory we gained from the Spanish war. Also let the children learn that not all insects are enemies, that some are valuable friends. Let them learn that without bumble bees we would have no red clover seed, and that if we had no honey bees we not only would have no honey, but we would have very few apples, cherries, plums or pears. With the modest ladybug in hand, tell them the story of its wonderful beneficence in three continents.

The knowledge gained by our experts in these matters, and in many others of like character, can not be of greatest benefit to the world until it is disseminated among the people who do the work and control the affairs of the farm. What other means is there of carrying this knowledge to those who are to put it into actual, practical use but to teach it in the rural schools? And so the up-to-date farmer will see that his children be taught those things that will enable them to make most of their lives upon the farm.

If you say to him that there is not time for all this, that there are already too many things to teach, *he* will tell you that if there is not time for all, if this is more valuable than what is now being taught, it would be better to omit some of the less valuable things. He will ask how much time is now wasted in teaching technical grammar, of which Professor Whitney says, "No one ever changed from a bad to a good speaker by applying the rules of grammar to what he said." He will ask how much time is wasted in trying to to teach children composition when their heads are empty of anything to write. Or what about the fearful waste of time working arithmetic? He knows that anybody can learn enough arithmetic, presented in the right way and at the right time, in six to ten months to do any of the ordinary business of the farm. He knows of no farmers who are losing money through ignorance of arithmetic, but he does know a big lot of them who are losing money through ignorance of the things they should and could have been taught at school. He asks about history teaching, which is so largely an account of wars and battles, and he says if his children must learn of wars he prefers also to have them study the war that must be made on the coddling moth or the chinch bug.

The "Up-to-Date Farmer" will not have his children taught that all knowledge is contained in books, but that very much of it is still out of doors; that it can be found in the field and by the roadside; that the great book of nature is full of truths for man if only he is taught to read them; and he believes it is the duty of the rural schools to teach their pupils to read this great book, and to love its wonderful and delightful story.

I have taken so much time to talk of the education of the farmers' children because I believe the weakest place in all that relates to the "Up-to-Date Farmer" is the present education of his children. Our schools as at present organized have a tendency to lead their pupils away from the farm rather than to train them for the farm. The "Up-to-Date Farmer" should at least pay as much attention to the training of his children as he does to the training of a good colt. If he wants his horse for one purpose he will not pay for having him trained for another.

Likewise the up-to-date wife of the future farmer will be trained at school so that she can understand the plates described in the "House Keepers' Magazine" as well as she can the fashion plates in the "Delineator"; and so she will select her cook with as much care as she does her milliner, and so she would no sooner order a dinner by telephone than she would a dress. But the Domestic Science branch of this association has its innings on Thursday and I must not trespass on their preserves.

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Another trait of our "Up-to-Date Farmer"—he is a kindly man, a gentleman. "There is Nothing so Kingly as Kindness." Nor anything more beautiful, nor probably anything more profitable, for one who lives upon the farm. Kindness, gentleness, not only makes the farmers' work easier for himself, but it makes work easier for every man and every beast upon the farm. A man of kindly feelings can do more work each day, can eat more and have better digestion, can sleep more and have sweeter dreams, than any other; and his kindness is catching, both by his family, and his hired men, and his farm animals. A horse that is treated kindly and that is not made fretful by an angry illtempered driver can do more work each day, is more easily taught, is more pleasant to work with, will keep in better order, and will live to be useful and valuable to a much greater age than one which has the opposite treatment. "When a man hits his horse he strikes his pocketbook."

On our horse breeding farm every man who was hired was carefully told certain things: He must never strike nor frighten a colt. He must never jerk a horse, either directly, or indirectly by slapping with the lines, nor could he have a whip.

Fatting cattle, our "Up-to-Date Farmer" knows, must be treated kindly to secure the best results; and none but amiable feeders win the richest prizes. It is reported that Brother Kerrick will not allow any man to swear at his doddies.

And the dairy cow: Here is where the "Up-to-Date Farmer" knows that kindness and gentleness secure their richest rewards. There is no noise, nor confusion, nor anger, nor illtemper in the dairies where the richest and healthiest milk is produced.

I am going to tell one thing more. One time, several years ago, I was way out west in Nebraska driving in a buggy with a young man, near the close of a June day. We were just passing a sod house. There was a girl just coming out of the door, apparently about 16 years old. She was dressed neat and clean, although she had bare feet. She had a nice bright pail in her hand. She looked way off west where there was a large herd of cattle, 500 or 600, and as she looked over she cried, "Come Sukey, Come Sukey!" I said to the young man, "Hold on." We went to one side of the road, and I took out a map pretending to look at it, but the young man was looking at the girl I think. When the girl called that way I saw a Jersy turn and travel right to her as rapidly as she could walk. When she came up she mooed just as a cow talks to a calf. She patted the cow and said "You good Sukey," and she put her arms around her neck, and pretty soon the cow turned herself around and she sat down and commenced to milk. At first it went ting, ting, and then pr-r-r, and prety soon the froth was running over the pail, and when the milking was finished she patted Sukey and the cow started off about two rods and then looked back and mooed, and the girl said "Good-by Sukey" and off she went. "She is nice" I said, and he said, "You bet" I meant the cow—he meant the girl. I thought there was a little chocking in his voice. They are some years older now, and are partners in the dairy business, and have a nice family, and they have got the best herd of Jerseys in the state of Nebraska.

There are many other traits of over up-to-date farmer, but time permits me to name but one more, he is a religious man.

When he has learned the story of the marvelous inter-relation of soil, and microbe, and air, and sunshine, and snow, and storm, and plants, and insects, and birds, and how all are mysteriously linked together—their being and his being. All this gives him the deepest reverence. Whether he belongs to any church organization or not he knows that the Christian Church is the greatest organism on earth whose only and avowed purpose is to make men better, and therefore happier. And because he wishes well to all mankind he gives it his hearty approval on all proper occasions, and he gives of his substance for its support, and to extend its influence. Of every cause that helps lift mankind to a higher level—that tends to make this world a better and a happier world to live in, there is no more earnest advocate, or stronger friend, than the "Up-to-Date Farmer."

Music, "Violets," (Wordman); "Delight Waltz," (Luckstone), Mrs. Bollman.

PRESIDENT: Mr. L. H. Kerrick, of Bloomington, will address you on "The Farmer as a farmer, and the Farmer as a Citizen." We know Mr. Kerrick is original in his thought, and you may look for something unexpected, but he will come out all right.

MR. KERRICK: Did you notice how the president disclaimed all responsibility. I have never hurt anybody yet.

THE FARMER AS A FARMER, AND THE FARMER AS A CITIZEN.

BY L. H. KERRICK, Bloomington Illinois.

Commencing with the morning, the cattle and horses and the sheep and swine and the production of the field, and the garden and the orchard, and the process of the home-building and house-keeping, will be called upon to undergo a three days' trial and examination under the hands of our able and thoroughgoing specalists.

Some sentiment—I think it is most like one of mercy, prompts me to let all of these sleep and rest to-night, in preparation for the ordeal through which they are to pass.

I will not talk about them, nor disturb them at all this evening.

I have been thinking of some other things which seem to concern the farmer, but about which the farmer seems to be not much concerned.

My thoughts would fit on or about a heading something like this. "The Farmer as a Farmer, and the Farmer as a Citizen."

The text sounds like a good one from which to speak on an occasion like this. and if I could of found sufficient time, I believe I might have prepared from it an acceptable agro-political sermon for you.

I will not argue anything this evening. I will not try to prove anything. Therefore, will not bother with logic, nor with the logical sequence of my statements. I have seen many things proved by argument, but I have never seen many people convinced by it. I will ask nobody to agree with me, and nobody to be responsible for what I say.

I may speak about something that reaches into the domain of politics, but you shall not know whether I am a Democrat or a Republican.

I will make statements, not offering proofs, leaving them to stand or fall by themselves. Do not make up your mind to anything while I am talking nor too soon after. It is not by purpose to have you do that, but rather to set you thinking of some things in which it seems to me you are much interested.

The American farmer has on his hands two, large, well-developed, robust, growthy, jobs, one is his farming business, and the other is that part of the public business which is on him to do and to perform as a citizen of the republic. Both these have valid and building claims upon his time and mind.

It would not be necessary to say that a farmer cannot safely neglect his farming at any point or in any detail. It is equally unsafe and it is unprofitable and unwise for him to neglect or to flout his duties as a citizen.

For better or for worse, we all have to do with the government, and the government, for better or for worse, has to do with all of us. We are affected, touched, directly—all of us—in all of our interests by the government.

Your lands, which you have given your savings to buy, your crops and herds, which you have given you toil and thought to produce, your houses and barn which you have labored and denied yourselves to provide, are touched directly, every year, by the government in a way that you can feel and measure in dollars and cents.

If there is a farmer present who has not seen that measure lengthening year by year—the figures in his tax receipt steadily and surely growing larger, he is a happy exception to the general rule.

Not only so, but indirectly you are touched.

The price of that which you have to sell and the price of that which you have to buy is often materially affected by the laws of the country.

It may be fairly and favorably affected or it may be unfairly and unfavorably. Surely the allround farmer must be a citizen as well as a farmer. If for no other or higher than his individual pecuniary interest, he must know and understand and attend to his public duties.

According to my way of thinking, the ideal government will be one which has the least possible to do with anybody's business. It will be a government that guarantees fair play and an equal show for all, favoring none, aiding none, simply protecting everyone, while he works out his own fortune and his own destiny. We have not yet evolved that ideal government.

At the present time we have very much government and are tending to more. Since every man has a hand in the government and since many hands make light work, we are in these days in this country accomplishing a good deal in the government business.

Every sort of private business is more or less affected—helped or hindred—by legislation.

Favorable legislation for one kind of business may sometimes become the ruin of another kind. For example, the admission at this time of raw sugars free of duty, may mean the destruction of beet sugar manufactured in this country, while it will be the making of the sugar refining interests.

Government interference in the business of private individuals or corporations is a powerful agent. It may be capable of doing good; certainly it is capable of doing much harm.

In these days we notice that the functions of government are being broadened and extended continually and that the expense of government is growing enormously.

The more government we have, the harder it will be to keep it good and fair and the harder it will be to run it economically.

In this broad and bountiful land the normal condition of a free, intelligent and virtuous people is prosperity and plenty for all.

If ever any other condition, or opposite condition prevails—extravagant, bad and blundering government will most surely be the cause.

If wise, strong, equal, economical government is to be maintained, I believe the farmers will have to keep themselves in evidence in the direction and control of legislation. We may not expect of those who thrive and live upon the taxes to stand against excessive taxation.

We may not expect of those whose main business is to get public office to stand against the multiplication of offices.

We may not expect of those who draw fat salaries from the government to "tear their shirts" in their efforts to lower salaries.

Those who live off the government, and they are an increasing army, are going to make it cost just as much as they can.

For a general proposition, I will say the farmer pays the bill for it all, but he does not sit at the feast.

The farmer has a business of his own that is better than almost any other business, so long as it has a fair chance with every other, and he is not hunting much for offices and salaries.

But in order to secure to his business a fair show and in order to save it from unjust and unnecessary burdens, he must keep himself advised of the condition and trend of public affairs, and with no hesitating hand, take hold with the others in their management.

Government suited to the wants of farmers, need not and should not be expensive. Simple, strong, econimically administered government is the kind the farmer needs and all he needs and all he should consent to pay for.

There are powerful organizations in certain branches of the government service whose leading objects is, using their own language, "to secure more pay through national legislation."

These public servants accept their places with alacrity, knowing the salaries they are to receive, but once in they organize to secure more pay.

The efforts of some of these organizations to secure more pay have become so aggressive and persistent that President Roosevelt has been constrained recently to issue an order forbidding all officers and employes of the government, serving in or under any of the executive departments, either directly or indirectly, individually or through associations, to solicit an increase of pay or to influence or attempt to influence in their own interests any legislation whatever, either before Congress or its committees, or in any way save through the heads of departments in or under which they serve, on penalty of dismissal from the government service.

That order has an aspect of business about it which should commend it to all business men and especially to farmers.

No valid reason can be assigned why goverment salaries, amount and quality of service being equal, should be higher than salaries or earnings in other lines of work or service.

To pay anybody for serving the government more than his services are worth—more than equal service in other lines of business is paid, is unjust to the tax-payer—it stimulates a demoralizing scramble for public office and brings politics and government methods into disrepute; but it is done and permitted all the time.

The lamest excuse, but the one most commonly advanced for paying big salaries to certain government officials is that it is necessary in order that the incumbents may maintain the style of living and entertaining in vogue in our capitals and cities.

It is not necessary that they maintain such style.

Officers of the government are but agents of the people, transacting the people's business.

They should receive adequate pay for services required and sufficient to maintain a style of living common to the people who employ them.

The farmer has no money to pay for vain show in goverment. Government is business, pure and simple, to be maintained for business and operated on business principles, like any other business, and it is the farmers' business and the farmers' duty to scrutinize the ever increasing outlays for government and to see to it that extravagance and waste and reckless and unnecessary expenditure and tomfoolery in general be cut out and lopped off.

Farming can easily bear and farmers will cheerfully bear a just proportion of the legitimate expense of good government, but they should stand united and immovable against every sort of unnecessary and extravagant use of the public money.

When there is money for excessively costly public buildings—money to spend for buildings of any kind that are not needed for the general good—money to spend for salaries of useless commissions and the like—then too much has been taken from you, my fellow farmers.

That is the money you should have to build you a better house, to build for you better barns; that is the money you need to better your home school where the children of most of you must get their schooling.

It is not evidence of thrift nor of strength, nor of prosperity to see innumerable and costly and for the most part useless public buildings arising in our capitals and cities; on the contrary, it is evidence that things are going a wrong way. Europe is piled over with costly public buildings; but what is the condition of the Europeon farmer?

There are in Illinois many public buildings, and your money built them, which are far larger and costlier than any present or prospective use for them would warrant.

When you see the homes of the land increasing in number and in comfort, that is evidence of prosperity; when you see farm homes increasing in number and in comfort, that is evidence of the greatest and most lasting prosperity.

Expensive government and the excessive taxation required to maintain it are essentially and particularly unjust to farmers, because their business, their habits, their temper, their desires and their ambitions do not call for, nor need, expensive government.

The last General Assembly of Illinois appropriated in the aggregate $13,248,000.

How many farmers took the trouble to find out how much that assembly appropriated? How many looked over the list to see what might have been cut out and ought to have been cut out?

But your property is all in plain view of the assessor; not only yours who are land owners but the property of the tenant farmer and even that of the thrifty hired man are well known to the township assessor and none of it escapes.

Those thirteen millions and more are largely taken from your surplus. Would you not better take a little time to inquire how much of it was really needed for legitimate purposes of good government?

If you should look over the list of appropriations made by the last legislature, you would find, for instance, $150,000 for the Illinois and Michigan canal.

You have probably seen or smelled the Illinois and Michigan canal. It is a dilapidated ditch, parly filled with a black, noisome, ropy fluid, running from Chicago to LaSalle.

It has commissioners; they buy some coal and some pumps, or patch up some old ones, and they pump some of the fluid into the ditch. They have some law suits and hire some attorneys and support the administration, and by such patriotic and indispensable services and endeavors, they use up the $150,000 and that is about all there is to it.

I chanced to be in the room of the Appropriations committee of the house, when the canal commissioners came to ask for that $150,000.

They kindly explained to the committee that the canal was the means of holding down railroad freights. It was not shown that the canal was doing any business to speak of, nor that it could. But the committee was to be impressed with the fact that the mere existence of the canal held down railroad freights.

I had often wondered why railroad freights in Illinois were so low.' You understand, ladies and gentlemen, that it is the Illinois and Michigan Canal that keeps them down.

The canal makes very little show of doing anything. It works quietly. It holds down freights while you sleep.

When the commissioners went out I thought—now the railroad men will come in to oppose the appropriation. They don't want anything laying around that holds down freights. But the railroad men did not appear.

First I wondered, but then it occured to me that the railroad people knew very well that the canal was not in their way at all and it soon struck me that they would like to keep the canal there to be used by the commissioners to fool the people with and to make them believe that it was keeping down freights, while the railroad men would make such rates as they liked.

The canal commissioners recently made a report to the Governor.

There was some grain, they reported, on the line to carry, but something was the matter with the canal and they could not get ready to carry it, so the railroads carried the grain.

There used to be a stone to carry, the commissioners reported, but that trade has gone to the drainage canal, therefore they have little or no carrying.

There were some receipts from water power leased to mill owners—not very large.

But we ought not to expect too much of the canal in the way of carrying grain or stone—it is busy, you know, holding down railroad freights.

Howevor the report shows that the commissioners are getting along nicely with the work of spending the $150,000, and they are supporting the administration of course, and everybody ought to be happy.

If any business farmer owned that ditch he would abandon it tomorrow, or lease it to the mills who want water power (and that is undoubtedly the only use left in it) leaving the whole cost of maintenance to the lessees.

In that way, a little net revenue might be derived, at any rate $150,000 could be saved, which is now practically thrown away.

If you will look a little farther in the list of appropriations of the last General Assembly, you will find $150,000 for an arsenal and armory at Springfield.

Now I am very well aware I must be careful what I say about arsenals.

If the legislature had appropriated $2,000,000 to build a dozen arsenals there would still be people to say of the man who questions the propriety of such an act that he is no patriot and he would be lucky to escape being called a traitor.

So all I will risk on the subject of arsenals is that I believe that 150 good new barns or 150 good new cottages in Illinois would be worth more in the long run to the people than a $150,000 arsenal at this time at Springfield.

When I hear that it costs about $1,200 to charge one of our big modern cannon and that every time one of those big fellows is discharged $1,200 goes up in smoke and noise, I cannot help thinking that $1,200 would build a cottage that would comfortably house a father and mother and four or five children; that it would build and equip two school houses better than the average district school house in Illinois; that it would feed and clothe and house a boy or girl decently and comfortably the whole period of his or her youth.

I am built that way and would not wish to be built on another plan.

If you would look a little farther in the list of appropriations of the last General Assembly you would find $52,000 for your agricultural college.

Organizations representing all the livestock and dairyman and horticultural—in short, all agricultural interest in this great agricultural state, were before the committe on appropriations asking for $70,000 for your agricultural college.

No one could be found, I presume, to dispute the préminence of agricultural interest in Illinois.

"Our wealth is in our soil;" our greatness is in our agriculture. Agriculture is our chief, our principal interest, greater than all others combined.

Of the $70,000 asked for, the college got $52,000.

I have no mind to go farther with this list. I have called your attention to these three items of appropriation to show you how easily public money is let out of the treasury for certain objects of doubtful utility or necessity and how grudgingly it was appropriated where the greatest interests of the state were concerned.

The instances are good illustrations of the attitude of law-makers toward farming interests and toward other interests.

It is an attude that is not statesmanlike, it is unjust, absurd. An attitude that ought to be corrected; but who will attend to it? Nobody unless the farmers do it.

The other fellows are not enough interested in correcting it.

What proportion do you imagine of the members of our legislature are nominated with a view to their special fitness to make laws for us to live under and to appropriate our money wisely?

You do not know, of course.

But one may guess that the most of them are nominated because they have promised to support some particular man for United States senate.

At this very time every district in the state is being assiduously worked in the interest of one or the other of the candidates for United States senate; and the result of the senatorial canvass will largely determine the make-up of our next legislature.

The little matter of appropriating thirteen or fourteen millions of your money is an incident—a side issue.

The methods of senatorial candidates are forcing me to the conclusion that it would be better to elect our United States senators by popular vote.

I will make the prediction that a constitutional amendment so providing will not be many years coming.

Then our legislators may be nominated and elected with reference to their fitness to attend to our State affairs.

Many things I have said this evening, ladies and gentlemen, and some that I have yet to say, are said because of a firm conviction that the evil results of unfair or unwise legislation and the losses, the deficits, for waste occasioned by mistakes and blunders of government, for the most part settle at last and rest upon the farmer.

It is the farm, agriculture, that at the last settles the balances, pays the deficits, makes up the losses.

Therefore, I address you as farmers and as citizens, having the intelligence, the numbers and the power to take care of your business.

Having the power, I would have you feel that it is your duty to throw off all unnecessary burdens; and to see to it that your business has its rightful standing under the laws of the land; and I would have you feel also that while you are looking after the interests of agriculture, you cannot be harming any other interests, but serving them, because the welfare of all other interests depends upon the welfare of yours.

The agriculture in the United States is in an unfair position, an unjust and an unsafe position, under existing tariff laws, I cannot longer doubt'

The present is commonly regarded as a period of very great prosperity in this country. It is spoken of as unparalleled.

There is indeed extraordinary commercial activity. There is great activity and expansion in manufacturing interests.

Within a few years we have seen prodigious development and growth in our commercial and manufacturing interests. Wealth is increasing rapidly. But it does not appear to me that agriculture is sharing equitably, nor that it can under existing tariff laws, in this prosperity. I do not see any increase in the number of good barns and more comfortable farm houses at all corresponding to the tremendous growth and gain in manufacturing and other interests not agricultural.

The farmers of the United States have been selling an enormous surplus for many years. Where has the money gone? It is my opinion that more than a fair share of it has gone and is going to pay arbitrary and sometimes exorbitant prices for highly protected articles of manufacture which the farmers have to buy.

But your lands are rich and under your intelligent cultivation yield abundantly. You can bear heavy burdens, if necessary, or expedient, and if that were all, your rational solicitude for the wellbeing of domestic manufacturing industries might furnish reason for longer maintaining high protective tariffs. But our manufactures are now invading foreign markets to an extent which threatens your market for your surplus farm products. Farmers can have no bargain with protection, which enables the manufacturer to hold this market firmly in one hand while with the other he grasps for foreign markets regardless of farmers' rights in those markets. The American farmer wants a friendly world to buy and use his surplus. Our protective tariffs, and the American commercial invasion of Europe, of which we hear so much, are not likely to incline European countries to favor American farm products.

We are now exporting $15,000,000,000 worth of commodities a year—agricultural products, manufactures, and all put together.

The amount we are buying each year from other nations is far less than this, and is declining rapidly year by year.

In the last six years it is figured that we have sold to foreigners $2,000,000,000 worth of commodities more than we have bought of them.

If we could only go on, it looks like we might all soon have money to burn. But there goes with it a question, a doubt, a certain uneasiness. Can this last?

You hear the question often. You are conscious yourself of a doubt about it. Some think it can not last simply because it is too good to last; others, more thoughtful, suspect there is something abnormal, artificial and unnatural about it, and that consequently it can not last; but all who observe, or think at all, are possessed of a feeling of uneasiness about the permanence and safety of present conditions.

Some would study the situation candidly, and these would courageously advocate those measures which appear to be necessary in order to save what can be saved of such a good thing, but which they can not believe they can hold entire.

Others would let it alone. "It is a good thing," they say; "too good to tamper with; let it last while it will and let us take what may come after."

That existing conditions can not last is obvious. Two thousand million dollars balance of trade in favor of the United States every six years would soon bankrupt the rest of the world. No matter what we might have to sell then, nobody would have money to buy it.

The situation is unnatural and abnormal and a readjustment is inevitable and imminent.

This nation is up against the greatest industry problem that ever confronted a nation.

Upon the righteous solution of the problem depends the welfare of all classes—farmers, manufacturers and all.

In the solution of the problem the American farmer is the chief party in interest.

"We must not repose in fancied security that we can forever sell everything and buy little or nothing." On the day before his assassination at the Pan-American Exposition, in the presence of thousands of his fellow-countrymen after mature deliberation, for he was speaking in fulfillment of a long-standing engagement, President McKinley uttered those words: "We must not repose in fancied security that we can forever sell everything and buy little or nothing."

Closely following, came that other most significant sentence: "The period of exclusiveness is passed."

Taken together what do these mean? They simply mean that we must sell less and buy more. That we can not sell to other nations $1,500,000,000 worth a year and buy little or nothing of them.

What are we selling? Five hundred millions of manufactures—$1,000,000,000 of agricultural products. We can not sell both these.

One or the other, the manufacturer or the farmer, must sell less, in foreign markets. And this is the question, American farmers, that confronts you.

Which shall sell less? Shall you sell your $1,000,000,000 of agricultural surplus or shall the manufacturer sell his $500,000,000 and let your $1,000,000,000 rot?

What is the right of the matter? Let us see.

WE ARE AN AGRICULTURAL NATION.

By the almost illimitable extent of our fertile lands, by tradition, by the number and character of our people engaged in farming, by the amount and excellence of our agricultural surplus, we are an agricultural nation.

Agriculture is easily the paramount industry of the United States. It is by our agriculture that we are distinguished above all other nations.

Agricultural supremacy and ascendency is the natural, logical and manifest destiny of this nation.

Agriculture, unaided and unprotected, is exporting $1,000,000,000 of surplus against $500,000,000 of all manufactures and other commodities together.

We are capable, naturally capable, without artificial aid, without bounties or tariffs, of increasing this enormous surplus, almost indefinitely.

Agriculture is in fact and of right imperial among the industries of the United States.

The sphere of agricultural influence extends to all legislation affecting agriculture or the relations of agriculture to other industries of the country, and that influence is, and should be, preponderant.

Our manufacturers, grown strong enough by long years of protection in the exclusive enjoyment of this rich home market, are able now to cross the ocean and undersell the European even in his own home market.

If the American commercial invasion of Europe continues and spreads, a revolution of industrial conditions there will certainly ensue.

Manufacturers there will be crippled. Capital and operatives will be driven back to farming and our $1,000,000,000 of agricultural surplus will not be needed. Present conditions have only to continue a little while until the American manufacturers will have both the American and European markets, and the European market for our agricultural surplus will be gone a-glimmering.

That the policy of protecting our manufacturers from outside competition in this home market has been in the past a wise one, there is not a doubt. The benefits of protection have been obvious and they have been general, all classes participating. That the policy greatly modified may be continued with benefit, I fully believe; but that radical revision and material reduction of tariffs ought not to be postponed is plain. To postpone may be to arouse a revulsion of sentiment that will sweep the statute books clean of protective tariff laws. No well meaning protectionist ever dreamed of nursing a manufacturing interest here until it should grow rich enough and strong enough to go out and take the earth.

The American farmer has the right to decide what shall be done in a situation like the present.

Agriculture, the greater interest, must not be governed by manufacturing, the lesser interest.

The creature must not rule the creator.

Europe is the natural, rightful market for the American farmer's surplus. Laws endangering it or tending to endanger it must go.

With bars down and handicaps off, if the American manufacturer can outrun the American farmer for the markets of Europe, let him have them.

By that he will prove his right to them.

But he may not expect of the American farmer that he will continue to wall himself in and gird the manufacturer up with high protective tariffs to make him sure of winning the race.

Not before have there been 40,000,000 farmers free, having equal civil and political rights with all other classes under any government.

Not before have there been as many and as rich farms owned by free men in any country as in ours now.

Never before was the art of agriculture making such progress in any country as at this time and in this country.

In the course of human events agriculture has reached a point of vantage before unknown to the world.

Agriculture is coming at last to its own.

If the farmer has borne the burdens of the world long enough—too long—he need not bear them longer.

Let all unlawful and unjust combines, let trusts, let corporate greed and corporate power, let parties and politicians and legislators, let lords and rulers take notice.

There is a new world power to reckon with. It is the empire of agriculture, and the American farmer is the emperor.

WEDNESDAY MORNING, FEB. 19, 1902.

Convention called to order by President Kimzey.

Violin Solo, Mazurka by Wienisawski, by Miss Olive Woodward.

We will be led in prayer by Reverend B. E. S. Ely. The audience will please rise.

Almighty God, our Heavenly Father, unto Thee we lift our hearts and our voices in prayer. We ask Thy blessing to rest upon us this day. Grant us Thy presence in the deliberations of this day. Be pleased so to favor us by Thy Divine grace so we shall be led to those results which shall be for the highest and the best. Be pleased, O Lord God, to remember us while we are here tarrying, keep us in health and in life. We pray for a blessing on those whom we have left in our homes, watch over them during our absence and in Thine own time do Thou return us unto them in safety and in peace. We pray Thee that Thou wilt bless us in all pursuits in which we are here engaged, so that we may follow them in accordance with Thy righteous will and each of us in his place, work out that high purpose of God that put us in the place. Be pleased, oh Lord God, to help us all to remember that there is a great vineyard and that the call comes to each one "Go work in my vineyard today." Let each one of us be found faithful responding to that call so that by and by when we come to the harvest home we shall come bringing our sheaves with us to joy and rejoice in the harvest feast and to receive the thanks of Him who is our Great Master and Righteous Lord. We ask it all in the name of Christ the Redeemer. Amen.

President: We will now be favored by a song by Miss Garlick from Beloit, Wis. In Egypt we think it is a long way to Wisconsin, but here Wisconsin is a near neighbor.

The President: When a change is necessary to be made in a program it is disappointing. In the dairy program we counted very largely on having Mr. Adams, the pure food commissioner of Wisconsin, with us. He is sick in bed and unable to be here. Mr. Knight, who is on the program this morning, was called to Washington and is pushing the bill which is of such vital importance to all dairymen. Mr. Newman, the president of the Illinois Dairyman's association, to whom these men reported, made an earnest effort to furnish other talent for the day. He received a note from Mr. Gurler as follows: "My brother tells me you wish me to go to Rockford. This will be impossible, on account of the death of my niece today and the funeral is on Wednesday. If this had not prevented, I would have been with you." We thought we could get Mr. Hoard, of Wisconsin, who we always like to hear, but he wired "Can't be with you at Rockford," so you see the committee has tried to supply the work, but death and sickness is something to which we must all bow. We have others with us who have been asked to substitute for the forenoon.

The work will be along the dairy lines this morning. I thought presiding over a meeting especially devoted to dairy interests no one would be able to do it more genially than the president of the Illinois Dairman's association, and I take pleasure in turning over the gavel to President Newman, who will preside over the meeting this forenoon.

Mr. Newman: Ladies and Gentlemen: Of course we had a little disagreement about this gavel business but I had to bow to higher authority. The dairymen are inclined to be intelligent people, and we believe they are among the best of the agricultural producers in this State and the northwest.

We like to stand shoulder to shoulder with all the different matters pertaining to the farm, and are always willing to do our part. We believe in deliberations of this kind. We want what is right and what is best and good for all as the prayer said this morning.

To fill out the program this morning I have arranged with Mr. A. J. Glover, who is doing field work and goes once in every seven weeks to the different farms and tests the cows and keeps records for a whole year and knows the practical results, whether they are keeping paying dairy cows or not.

Allow me to introduce Mr. A. J. Glover.

TESTING DAIRY COWS.

By Mr. A. J. Glover, University of Illinois.

Mr. President, Ladies and Gentlemen: After you have heard what you have in regard to being disapointed in prominent men, it makes me feel something like the darkey who went fishing. He went a fishing, so the story goes down south, and caught a nice bass. He puts his bass on a stringer and it went swimming about in the water and couldn't get away, so the darkey drifted down farther and tried again, but caught no more. During his absence another young fellow came along and took the large black bass, and put a little bit of a sucker on the string. When he came back, the darkey pulled the string up and looked at it in astonishment. Then he looked at the sky, it was the same sky, the same woods and the same spot. Then he looked at the fish and said, "You little cuss, you've shrunk up so."

I was to fill in here for a short time this morning, telling what we are doing in dairy field work in Illinois; to tell you the character of the work and how it is carried on.

The State, during the meeting of the last Legislature, made an appropriation for a small amount of field work to be done. It provided for a man to go into the field and find out the actual dairy conditions as they existed in Illinois. We have taken the northern part of the State, as the dairying is largely confined to this section.

The work consists of a man going about and getting individual herds, and takes the individual cows of that herd and see what they are doing. It has long been realized by men who have made it a study, that the farmers are carrying a great many cows of their farms that do not pay for their board.

The work we are asking the farmers to do is very little, to find out what their cows are doing. We go to a farmer, who is interested in improving his herd and interested in getting a greater profit for the feed they consume, and furnish him with the apparatus for doing this work—a pair of spring balance scales, the tablets for preserving the composite sample and the bottles for holding the same. I go to his place and make this test once in every seven weeks and enter the weights and the tests of his milk in my record book, and all concerning his dairy work. In this way we are able to tell what each cow has done.

The work as we have it outlined at the present time is this: We have the farmer weigh and sample each mess of milk every seventh week. You may not think this often enough, but after taking a certain number of cows whose milk was weighed and tested every day for a year, and by doing this we know how much milk and butter each produced during the year, then we computed her milk and butter record from the weights and tests of every seventh week during her period of lactation. We found the variation was not over 7 per cent. If we can come within 7 per cent or even 10 per cent of what the cow is doing in your herd, we are getting pretty close. As I was saying, every seventh week the farmer is supposed to weigh a sample of each mess of milk from each cow in his herd. He places the little sample of milk in a composite bottle which is provided with a tablet for preserving it for a week or two. He mixes it thoroughly every day, and at the end of 14 consecutive milkings I come with my traveling outfit and test that milk. We have the weights and tests of each cow in the herd for a whole week and from this I can figure exactly how much each cow has produced in that week of weighing and sampling. From this we estimate what she has done for the three weeks past and what she will do the three weeks following. Then for the next six weeks the farmer goes on with his regular work in the same way until I notify him it is time to begin weighing and sampling again.

That is all there is to do, unless the man is interested in keeping track of the amount of feed and the kinds that he is giving his animals. I have some farmers who weigh the grain when mixing it. For example, he mixes together one-half bran and one-half corn meal. One hundred pounds of each is weighed and mixed together. He then takes a measure and weighs it full of this mixture of grain and by keeping track of the number of measures that he feeds each cow, he knows approximately how much grain each cow is getting. The roughage is also estimated in a similar manner.

At present I have all the work I can attend to. When I first commenced it was hard to get any one to take any interest in it at all. They took me for a creamery-shark. They wouldn't let me test their cows; thought I was working for some creamery, or a crank of some kind. When I had been to their places three or four times, they found out I was no creamery shark or connected with any creamery, and the work goes splendidly. I was told of 12 men last night who wanted this work done, but as I have four already in that neighborhood and all I can possibly do, I had to refuse them the privilege.

We want to find out as near as possible what the cows are actually doing, and when I come next year with a full year's record that I will be able to say these records are correct. I have about 350 cows under the test, and from them we are going to get a great amount of information, and we will be able to show up the great difference in individual cows.

What is the object of this work? Simply to improve the dairy herds of Illinois; to improve the general dairy conditions; to get the farmers to build better ventilated and lighted barns; to get them to see better methods of breeding; to get them to select better cows and to sell their poor ones; to get them to care for and feed their cows more judiciously. I find if there is any attempt at ventilation that it is all wrong. A hole is cut through the ceiling which lets out the warm and purest air in the barn. What we want is to get some means to take it out at the bottom. Light and ventilation are what is most needed in the barns, and I might say cleanliness in a great many cases. I go to some of these farm houses and have a chat with the farmer and tell about these things, and try to show them how they can be improved. This is the object of the work.

What suggested a man for the field, to get the farmers to sample and weigh from time to time each mess of milk from every cow in the herd? I will give you some reasons taken from another state. I have not been in Illinois long enough to answer for this State. Governor Hoard, in the spring of 1900, sent a man into Iowa to examine and find out what 100 herds of dairy cattle were doing in that state. This man was to go to the farmers and find out just how much dairy knowledge they had; just how they handled their dairy cows; whether they had good ventilated barns; whether they saved the manure; whether or not special dairy breeds or dual purpose cows were used; whether they read the dairy papers or agricultural papers. In short, to find out how much dairy intelligence was put into their business. In that 100 herds were 982 cows. The results are something like this:

All the farmers were selling their milk to creameries. Out of that 100 herds there were four (4) gave a profit of $2.11 to $2.30 for every $1 worth they consumed. There were 12 out of that number that gave a profit of $1.50 to $1.91 for every $1 worth of feed that they ate; 23 out of them gave a profit of $1.20 to $1.50 for every $1 worth of feed given them; 26 herds out of that 100 gave a profit of $1 to $1.20.

And now we come to the dark side of the picture. Thirty five out of those 100 herds of cows charged the owners from 2 cents to 66 cents for their keep;

35 herds out of that 100 did not pay for their board; some of them only gave 44 cents for every $1 they consumed, while others, only 2 cents difference. The extreme contrast is one man receiving $2.30 and another only 44 cents. That is one of the reasons that suggested Illinois taking up this work. I was talking to a man the other day and he said that he believes only one cow in three was paying for her keep, and he asked, "How do you find it?" I quite agreed with him on those I had tested.

Ex-Governor Hoard was once upon a time talking in a meeting in Maine on the subject of breeding, when an old fellow arose and shook his head and said: "I believe it is all in the corn crib, in the feeding." The Governor reflected and said: "Uncle, you are the man I have long been looking for. I want to find a short cut in the breeding of cows. You have seen this razor-back hog with long, legs built for running?" "Yes." "How would you feed that hog to make a berkshire or a poland china out of it? How would you feed a jersey cow to make a shorthorn out of her of the beef type? How would you feed a trotting horse to make a draft horse?" Then the Governor went on to state that there was once a little horse in Wisconsin by the name of J. I. C. that could trot a mile in 2:10 when fed 12 quarts of oats. I dare say you have horses on your farm that couldn't trot a mile in four minutes if you put four tons of oats through them." Is it all a question of feeding?

What were the results in making this investigation in Iowa. It was like this: Out of all those herds they returned about $27 per cow to their owners. Butter fat sold at 19 cents a pound but the cow only returned $27 and the average cost of feeding her was $26, so you see there was about $1 profit from those 1,000 cows kept in Iowa. And haven't we got some here in Illinois? That is what we are trying to find out.

In Minnesota, where I come from, the Experiment station had cows that gave us a large profit, and others that gave very little, but were handled in the same manner. Each mess of milk is weighed and tested every day in the year and this has been done for 11 years. I don't suppose the cow has received a ration but that it has been weighed. The records are there for 11 years of each cow in the herd. The cows were divided into groups. Some of the groups were classified as special dairy cows, and others as the dual purpose cow and the beef type, etc. Professor Haecker found that the cows gave a great difference in profit. One class of cows gave a profit of $8 and paying for their board and the feed they consumed was figured at market prices. Another group of $20; another group of $23, and the special dairy cow gave a profit of $45. There is this difference in cows eating the same amount and kind of feed, kept in the same barn and milked by the same man. One cow gave a profit of $8, consuming the same amount, occupying the same room, taking the same amount of labor, and then on the other hand, was a cow that gave a profit of $45. These things are not impossible on the dairy farm. This $45 cow may be a little bit higher than we can expect of the average cow for some time to come, but she is by no means impossible. Here was one cow producing 500 pounds of butter, and another less than 200 pounds of butter in a year.

At the Illinois Experiment station Mr. Fraser fed two cows. One cow gave over 560 pounds of butter, and the other about 300 pounds in a year, and they consumed the same amount of feed, and you will notice the great difference. The only way we can find out about this is by taking the Babcock test and the scales and weighing the milk from time to time and also testing it. The Babcock test and the scale are not always an absolute settlement for a dairy cow.

We must also take into consideration the dairy form. We must study that and learn the dairy type. We want a cow with a large body because she must have a good digestive tract to digest and assimilate her feed. The dual purpose cow—and she has a place. I have not gotten so far that I have no use for the dual purpose cow. We often find people calling cows dual purpose, when they are only scrubs. I was saying, we must not take the Babcock test and the scale as conclusive evidence of the profit of the cow, for cows will have their off year. We must care for them and learn to like them. I was pleased to hear Mr. Carter last night speak on the necessity of being kind to the cows. In Mr. Gurler's herd, I have 65 under this test every seventh week. He has one cow, a jersey, a very fine type of dairy cow. The least thing disturbs her, she is very nervous. They were somewhat crowded for room and wanted to put her in another row. They moved her, but that cow was uneasy and everything seemed to go wrong with her; she would not give her milk down. They changed her back to the other side in another stall, and she tried to turn around and get out. They finally put her back in her old stall, and the same man milked her that milked her before, and she gave nearly twice as much milk as when handled by a stranger. Some cows would not have minded the change at all but she was extremely nervous and sensitive. We have to take all these things into consideration.

I have something here which I wish to give you; some of the records I have got. They are not complete, but I wish to give you some of the figures. It is like the German said of his wife: "My frau is not so very good looking; but Mine Gott! she is the best I have by me." There will be a chance here for criticism, for some of these cows were fresh and some were not. The herd here that is doing the poorest has the larrgest per cent of new milk cows in it. I have selected three herds, because I wish to bring out several facts that is in them this morning.

Here is one herd I have been testing. It contains 12 cows. In one week they sold 1,305 pounds of milk from that herd; 40 pounds of butter fat. How much feed did they take and how much did it cost to produce this milk? The cost of feeding those cows was $12.18. That is the figure at what you could place the feed upon the market for. It does not figure hay $13 a ton; I figured it at $10. He had fed $12.18 grain and roughage; received $10.80 for milk which is a loss of $2.11, a direct loss upon the milk. He received his skim milk back valued at $2.77, figuring it at 25 cents a hundred. Figuring corn 56 cents a bushel, your skim milk is worth 30 cents for feeding young stock. He received $2.77 cents worth of this skim milk to feed to his young animals. That gives him, including skim milk and amount received for butter fat over and above the cost of feed 66 cents profit on 12 cows for one week. That does not include the labor, and that is that herd's best week of profit. Twenty-five cents a pound of butter fat, milk 75 cents per hundred; average test was 3 per cent. The ration? I figured the same prices on all these herds, so comparison will be on the same basis. The ration he was feeding here was 10 pounds crushed corn; 40 pounds silage and 10 pounds stover.

Q. That price is too low for milk?

A. Will you pay $1.02 for 3 per cent milk.

Q. They pay $1.02 on average test. The average test is 3.80.

A. You have almost a 4 per cent test. This is 3 per cent milk and selling by the test.

Q. Are you figuring on that one herd?

A. Yes.

He was feeding 23 pounds of dry matter to that herd. There was about 1.32 pounds protein and 15 pounds of carbohydrates; that ration was extremely rich in carbohydrates and extremely low on protein matter. It is a poor ration. His herd was in bad condition. Their udders have become caked and he has disposed of six of them already because he has found out through this work that they are not paying cows. His silage is sour. He is giving them all a corn ration and the combination seems to be bad at the present time.

Q. Were they dual purpose cows?

A. I should call them common natives, you might call them dual purpose cows.

Q. What do you call a dual purpose cow?

A. Is one that's medium size to large, weighing about 1,200 pounds. She has not as broad a back as our beef animal, but she is broader than the dairy cow. She has a deep body and a well developed udder, good milk wells and veins. She has good depth of body and not too heavy in the thighs. A cow that is medium, between the typical dairy and beef animal.

Here is another herd in the same community. The man sold 1,870 pounds milk and 69 pounds butter fat. The cost of feeding was $14.06. The net returns he received from butter fat at 25 cents per pound was $17.40.

Q. How many cows in that herd?

A. I think 16 or 17.

He received $17.40 and the cost of feed was $14.06, leaving a profit of $3.34 for the week. Figuring his skim milk as I have before would give a profit of $7.32. The ration contains 14 pounds of grain, 9 pounds of bran, 5 pounds of corn, oat straw and corn stover all they will eat. That is a ration which is exceptionally rich in grain. It is a heavy ration, 14 pounds a day to a cow, so he is feeding less to the cows that are getting well along in the period of lactation; this ration is only fed to the fresh milk cows. He was feeding 2.23 pounds protein to his cows; enough protein for a cow that is making 400 or 500 pounds of butter a year. I believe in feeding according to the amount of milk and butter the cow is able to produce. There is no use trying to crowd a 150 pound cow to make 500 pounds of butter. A cow that is only making 200 or 300 pounds of butter does not need as much as the cow that is making 400 or 500 pounds. Some of the scientific rations are all wrong for some cows. Two and one-quarter or two and one-half pounds of protein for cows that are making 400 or 500 pounds of butter is all right. If you feed these 200 pound cows as much protein as the 500 pound cows they will use that feed to make flesh or waste it and not make milk. Feed according to the amount of milk and butter that the cow is giving. This man was feeding extremely high in protein; he was feeding too much, I think, for the class of cows he has. If he had 400 or 500 pound cows, this ration would be excellent, and an excellent one for the fresh cows. Feed a fresh cow all she will use to the best advantage, but during the latter part of her period of lactation she does not require the same amount of feed as a cow on the full flow, and a great many men are making the mistake of feeding the same amount of feed through the cow's whole milking period.

Here is another herd that was in the same community. This man has 18 cows. He got 2,563 pounds of milk from these 18 cows; he sold 92.63 pounds of butter fat. It cost $16.81 for feed for them. As you will remember, it cost one man $12.00 for feed, another $14.00, and this one $16.81. This man spent $4.00 more and received about twice as much milk as the first man, who only sold 1,305 pounds of 3.08 per cent milk which gave 40 pounds of butter fat. The net profit on the total amount of butter fat at 25 cents a pound would be $23.00; the cost of feed, $16.81, gives a profit of $6.34. Here we had one man lose $2.10, another man makes a profit of $3.35, and here $6.34 profit, from about the same number of cows, and feeding about the same amount of grain and roughage, and selling milk to the same creamery. If we add the value of this man's skim milk he has a net profit of $11.78. Here is the ration: 4 pounds of corn, 4 pounds of bran and 1 pound of gluten meal, and timothy hay about 5 pounds, and all the stover they will eat. This ration comes out nicely for a cow giving the amount of butter fat they did. It is, I think, the best ration I have here in my list for cows that are giving about the same amount of butter fat that these cows are producing.

Q. What is their test?

A. Three and sixty one-hundredths.

He has a cow that is doing exceptionally well. They call her "Crazy," but she don't act like it. Gives nine pounds of butter every week since she calved. If she keeps on she will be a 350 pound cow.

We must not put too much dependence on a cow from what she does the first three or four months. The cow that is a persistent milker is the most likely to make a good record. It is not the one that commences big that always lasts. He has a Jersey near the end of her period of lactation. She comes in the first of April. Her milk tests 4.4, and has been milking since last May, I think, so you see she has been milked nearly a year, and gave nearly five pounds of butter fat from Jan. 16 to Jan 23, or for seven consecutive days. She shows a persistent producer.

While these records are not complete, they indicate the great variation in cows in Illinois. I hope next year to have the records more complete, and more interesting and convincing, so that when I appear before you I can give facts that we have found in our own State, and not have to go to Iowa or Minnesota to obtain them.

I am glad I have had the opportunity to meet you.

Q. Can you feed butter fat into milk?

A. No sir.

Q. If I feed a cow all straw, tests 3 per cent, and enrich her feed in corn meal, can I increase that butter fat?

A. I think you decrease it. If she has been fed straw, she is only giving a small amount of milk. You are not feeding a cow in a normal way when you feed only straw. When corn is added you will probably increase the flow of milk and the test will undoubtedly become lower; it will go down rather than up.

Q. You say you can't feed butter fat into milk?

A. That is what I said.

When I worked in northern Minnesota, where the grass was wild and cured quickly, and the cows were not giving much milk, they tested more than cows in the southern part of the state, where they fed plenty of grain and more succulent feed.

Q. Does fresh milk test as high as old milk?

A. The nearer the end of the period of lactation the higher the test. As she advances in her period of lactation the solids and butter fat increase.

Q. How much would be the churn test, or oil test?

A. A test of 4.2 for example, she will make about 4.9 of butter, because the butter fat or oil is simply fat pure and simple, while butter has about 15 per cent water and salt in it. We usually add 1-6 to the butter fat.

Mr. Sprague: Q. Why is it if you can't feed butter fat into milk the same herd will test a great deal different than others when a change of feed is made?

A. I can't explain that. I have seen a cow that was fed the same kind of feed test 3 per cent in the morning and 5 per cent at noon, and yet they seemed to be perfectly normal. I cannot explain that. Hoard says the darkest place on earth is the inside of a cow.

Q. Then in decreasing or increasing the butter fat in milk, if any change is made at all, you say you decrease the fat in cows rather than increase it?

A. I think decrease, but I cannot answer that question. A cow sometimes becomes agitated and nervous, and that will make a shrinkage in the milk and increase the fat. I have seen cows that were sick and tested 16 per cent, but gave very little milk. Strangers coming around nervous cows will make a difference in the amount of milk given. All kinds of feed have been given them to increase the fat, but it made no difference. We cannot feed fat into milk.

Mr. Campbell: Q. How do you account for the longer a cow is milked the more the fat will increase, or rather how do you account for a fresh cow that out tested any time during the year?

A. I cannot explain that. I think she must be a freak. There are some things we cannot explain. The general rule, Mr. Campbell, is that she increases in test as she advances in her period of lactation. The total amount of butter fat will be less, but the test higher.

Q. Outside conditions affect them?

A. Yes, sir; a lot of things; flies and all such things affect them.

Q. Then if I want more butter I must get different cows or increase the flow of milk?

A. The selection should be based on the quality and on quantity. I know a man who wanted me to test his milk. He wanted a high test and bred for this, and got a herd with udders as big as goats; got 7.8 per cent test, but didn't give milk. Let us bear quality in mind when selecting cows, also quantity. Don't select for quantity regardless of quality.

Q. Why is the test higher in my cow during the first period of lactation?

A. I don't know unless the cow is feverish. Was you feeding her any thing to make her feverish?

Q. She was a little feverish; may be I was?

A. I guess you were.

Q. Isn't it a fact that a heifer that tests low at two years old may, the succeeding season, be a much better tester, and at the same time give more milk?

A. A heifer does not test as much as an old cow. The cow that made the record in Minnesota never tested over 3.2 when purchased, or thereabouts. They shipped her up there and she made an average test of 4.2—84 pounds of milk per day.

Q. Was she a Jersey?

A. No; a Holstein. If you take Hoard's Dairyman, it is in there; some time about the first of January issue. You write to them and they will send you a picture of that cow.

By the Chairman: Better yet—take Hoard's Dairyman; subscribe for it.

Mr. Russell: Q. Can you give us any rule that we can pick out heifer calves that are going to make good heifers?

A. Go farther back yet and see that a good sire is selected. Get good sires and breed from your best cows, and from them I should select my heifers for making my milk cows. These heifers will have some indications of a dairy cow from the time they are a few months old. They will have deep bodies, for one thing. You don't want to get a beef type on those heifers. Her hips will begin to show when young; good milk wells, feel under her belly for them; some are large and some are small. They should be large. She should have a clean cut neck and head; her general type is spare. She has no tendency to lay on fat.

Q. I would like to know what is a balanced ration for milk?

A. A ration made up of the feeds that are on the market.

Q. What is a balanced ration for milk, say in Chicago?

A. I should think the same as sending to a creamery. I should feed according to the amount of milk my cows were giving. In giving a large flow of milk, 30 to 40 pounds, 2½ or 2 pounds of protein, and for succulent feed there is nothing better than a silo. Feed green corn in summer and she will make all kinds of milk. Why not feed her that corn in winter in the silo and she will do the same and thus avoid so much of this expensive feed?

Q. I feed my cows cob corn just as it is.

A. What do you feed with it?

Q. Nothing.

By the Chairman: This discussion is very interesting, but we have others on the program and shall have to draw this to a close. We will now hear from a practical dairyman, Mr. J. P. Mason of Elgin, Illinois.

HOW TO MANAGE A DAIRY HERD.

By P. Judson Mason, Elgin, Ill.

Mr. President, Ladies and Gentlemen: In managing a dairy herd, be it the special purpose cow, or the dual purpose cow, we have the same object in view. The farm and buildings are the fixed capital; the dairy and tools are the working capital. The object is to make the working capital pay the largest per cent possible on the fixed capital. As in any line of business, its value is measured by the per cent it will pay on the capital invested.

Tributary to Elgin, the farms are largely managed by tenant farmers, probably 75 per cent of them. The landlord furnished the farm with good buildings, suitable for dairy purposes, and the dairy. The tenant furnished the teams and farming tools, and performs all the labor necessary to run the business. Each receive one-half of the proceeds of the farm and dairy, and in changing cows, which vary on different farms, from 10 to 33 per cent each year. Those changing the most realize the greater per cent. What feed is purchased, each pays half.

Comparatively few farms are rented for cash. There is a vast difference in the per cent these farms pay. Some of them pay a greater per cent on a valuation of $100 per acre than others do on $40, with local conditions the same. The difference is largely due to management—an item well worth looking into.

By having a farm stocked with a dairy, which brings the soil up to a high state of fertility and increases its productiveness and value, and with thorough cultivation and preparing a perfect seedbed, there can be an abundance of feed raised which is essential to the production of milk and keeping of stock.

As the land increases in value, that value can be met by careful and better farming; by producing more feed to the acre; keeping more stock to the acre, and producing more milk to the acre.

We formerly planted our corn in checks three feet eight inches, and as the land became richer and stronger, we reduced that check to three feet four. The last few years we have planted three feet each way.

In planting three feet eight inches there are 3,240 hills to the acre; with the three feet check there are 4,840 hills, an increase in number of hills on an acre of 50 per cent. There should not be over two or three stalks in a hill; two is better. If you can grow an average of one pound per hill, you will produce 86 bushels of corn per acre.

In planting we make the first two three feet from the fence. We aim to get the use of all the land in the field. Do not lose sight of the fact that this high state of fertility of the soil must not produce anything but corn. Therefore keep it clean and thoroughly cultivated. We put in as many acres as we can conveniently handle. It has been often said, and well said, that "Corn is King" and "Clover is Queen" of the dairy. These crops, with the addition of bran, are our main reliance; therefore, it is necessary to have an abundance.

I have taken a little latitude in my subject. While I admit a man might be an excellent dairyman and a poor farmer, or vice-versa, yet owing to the small margin between the market price of dairy products and cost of production, to be a successful one he must be thorough in both.

For years we have run what you might call a winter dairy. We aim to have the cows fresh in September or October, as that is the time when we stock up for our winter run. We select well bred cows of fair size and not too old. The quality and type should regulate the price.

As we sell our milk by the quantity, we prefer the Holstein, but our market objects to an all Holstein dairy, so there are a good many shorthorns of the milking strain used.

As they become fresh, feed lightly at first and gradually work them up. As the feed is increased, the milk flow increases; as the milk flow increases, the appetite increases, and so you work her up to her full capacity. They can be held to a full flow of milk only by the most judicious care and feeding.

Do not overfeed. Do not feed more than they will eat up clean and have a sharp appetite for the next feed. Feeding and milking should be done with the greatest regularity possible. The feed can not be made any too good for the cow. The hay should be early cut and nicely cured, so that it will have that greenish cast and fresh, sweet smell. She enjoys the meal freshly ground and the fodder freshly cut. She will not relish stale food of any kind. Salt them every day and provide water boxes so that they can have access to water at all times.

Some winters we have made milk exclusively from the corn crop, with the addition of bran, and feed as high as 20 pounds of grain per cow a day, one-half meal and bran by weight, and the fodder from which this corn was taken furnished the roughage. By having good clover hay as part of the feed, the grain ration can be reduced one-third and give as good results, but even the above way of feeding corn, after the bran has been deducted, will pay a handsome price per acre.

The cows should have the best of care, kind and gentle treatment, so that you can approach them in the stable yard or pasture without any fear on their part. The stable should be warm, well lighted, well ventilated, and have a cement floor.

Stable them in early fall as soon as the nights become uncomfortably cool. A milk cow should not be exposed to any frost. As the weather grows colder we keep them in all the time, except an hour or so in the morning while the stables are being cleaned.

Each cow has her individual stall and soon learns her place, and the feeder knows where to find each cow. They are not all fed the same. I believe a cow feels at home in the stall she has become accustomed to. And then each milker must commence with the same cow, also milking the same cows in regular rotation. The milking should be done quickly and in as cleanly a a manner as possible.

The cows should be heavily bedded, and it should be shook out and kept level and not allowed to bunch up. It not only makes it easy and comfortable for the cow, but keeps her clean and nearly doubles your loads of fertilizer, which is no small item in keeping up the fertility of the farm.

It has been my experience that winter dairying is more profitable than summer. It takes less land to produce the feed than it does in summer, where pasture is used. A cow will give more milk for a longer period; she is better looked after and cared for. She has turned the raw material of the farm into the finished product.

This daily round of feeding and milking is continued until about the middle of May, varying a little with the seasons. As we always reduce the dairy, it can now be done to good advantage, and we usually reduce it a third, sometimes nearly one-half. The cows being in good flesh at this time are sold for beef, often bringing as much as they cost and sometimes more.

There should always be a provision made for summer feeding, as the pastures of late years are of very short duration. Oats and peas should be sown as early as the season will permit, at the rate of one and a half bushels each per acre, and to be fed when the pastures begin to fail. Clover makes an excellent feed cut and fed in the stable, before the oats and peas are ready.

We seldom turn the cows out to grass before the 15th or 20th of May, so as to give the pasture a good start. It is a good plan to give them some hay while the grass is fresh and rank; it prevents them from getting too relaxed.

The cows should be well fed in summer as well as in winter, and not allowed to run down in flesh, getting thin and out of condition. The cows giving milk are given a feed of grain night and morning, and are always on hand at milking time, consequently have no use for a dog. There are some months it may not pay to feed grain, but by doing so, you will keep the dairy up so they will be ready to do business when it does pay. What you feed in the barn they do not have to hunt for in the pasture, and then probably not find it. I believe with a dairy or any kind of stock if it is worth keeping at all, it is worth keeping well.

In farming and dairying, as in any business, there should be a strict book account kept of all transactions, capital invested, labor expended, taxes, insurance, and all running expenses, for the use of which, all have to be deducted from the gross receipts of the farm before any profit is rendered. This will stimulate the ideas of the farmer to better his conditions more than any one thing, as he compares one year with another and sees where he can improve on the past.

By getting better acquainted with his business and in being a better judge of values in buying and selling stock, by doing better farming and trying to raise larger crops, in good care and liberal feeding of stock, and close attention to his business, all of which will tend to raise the per cent of profit on the capital invested.

DISCUSSION.

Q. Do you stable your stock in summer?

A. Yes sir, while feeding and milking.

Q. Feed them some?

A. Yes sir, you feed her and she will always be ready for milking. You keep the cow up in good condition and she will be in shape to do business; that is a great point in dairying.

Q. Any experience in feeding ensilage?

A. Our factory don't allow us us to feed ensilage.

A. Can't feed ensilage or gluten meal. Our feed is largely corn meal and bran.

Q. Any oats?

A. We usually sell the oats and buy bran.

Q. Do you think feeding ensilage taints the milk?

A. Had no experience.

Q. Do you grind your corn fine or coarse?

A. Fine.

Q. Ever mix cob with the corn meal?

A. Trying it this winter. Everyone fed shelled corn, but this winter trying the cob corn meal.

Q. I have had experience and have fed it for years?

A. That's what we are doing this winter, owing to the high price of bran.

Q. How much do you feed your cows each day?

A. When the dairy is on full feed, about 20 pounds per cow.

Q. How much milk from your best cows on 20 pounds of grain a day?

A. Take the dairy, they should average a can to three cows during the milking season, say for ten months.

Q. About 22 pounds to a cow?

A. Considerable more than that, as through the first half of the milking season, we often get a can from two and one-half cows, sometimes a little better.

Q. Do you get enough more milk to pay for the extra feed? Will a cow give you 18 pounds of milk on 10 pounds of grain?

A. There may be a way of getting something for nothing, but I have never found how in the dairy business.

Q. If you get 18 pounds of milk from 10 pounds of grain, would you be losing?

A. I have always fed that way; it has been my observation and experience, that the liberal feeders were the most successful. If you could make 18 pounds of milk from 10 pounds of grain, you certainly would not be a loser.

Q. How do you keep up the fertility of your soil if you sell your milk?

A. Careful farming, good crops, keeping the farm heavily stocked will increase the fertility of the soil.

Q. How long do you keep the same cows on your farms?

A. Some of them we do not keep a great while, change perhaps 25 per cent of them a year.

Q. How long do you keep your good cows?

A. As long as there is a profit. A cow will wear out the same as a machine.

Q. The harder you work her the quicker she gives out?

A. I say when the profit gives out she gives out for me.

Q. Do you buy your cows?

A. Yes sir. I let the other fellow raise them and I can buy them for less value than I can raise them.

Q. You get beat sometimes?

A. One will get beat sometimes at almost anything.

Q. How do you like shock corn?

A. One feed a day will make the cows do better, it makes a change and is relished by them.

Q. How many pounds of milk in a can.

A. Sixty-eight.

Q. How many stalks to the hill did you get on that corn?

A. Two or three.

Q. Make it for the purpose of fodder, not corn?

A. Two will make more corn.

Q. Do you shred your corn fodder?

A. Cut it; cutter and thresher, combined.

Q. Do you raise the corn for the corn and fodder, both?

A. We raise it for the corn and fodder, both.

Q. Don't you raise it for the milk ration in it?

A. Yes, sir. Have to be careful in getting it up, and then we stack it generally; thrash and feed it. A cow will like it fresh. We don't cut up a lot of it at once, but keep it fresh, and we thrash that and then grind the grain as fine as possible. Then we have mixed it with bran, same weight; light bran, the lighter the better.

Q. Do you get any better results from shredded corn fodder than corn stalks?

A. No.

Q. What time do you cut your corn?

A. When it is ready to cut; when it is glazed lightly, about the first of September.

Q. What do you say should be the state of the corn?

A. When it is glazed over and commenced to harden up or dent.

Q. Do you let it stand as late as you can before frost?

A. Yes, sir; but it should be in the shock before frost, or before it dries up.

Q. Ever use much oats?

A. Never used many oats.

Q. They are selling bran $20.00 a ton?

A. Yes, I know it.

Q. How many kernels did you say to the hill of your corn?

A. Two or three.

Q. How many cows to the acre around Elgin?

A. Vary a good deal. I keep on one of my farms 50 head of cattle on 110 acres; that is a rented farm.

Q. Do you cut up your corn and put it in the barn?

A. No, we put it in large shocks. We get it in the stacks, all we can't feed, before the first of January.

Q. How do you stack it?

A. Mound stacks, four or five loads, or in ricks. Some folks think fodder is not good if kept over a year. I have threshed them the next year and gone up a can of milk.

Q. What do you thresh it with?

A. A regular corn thresher; separates all husks and cleans the grain.

Q. Use corn husker?

A. No, corn thresher.

Q. Ever kept it two years?

A. Yes. I suppose the older the corn the stronger it is. Would not think the fodder would be as nice and green as it is.

Q. Ever try sweet corn?

A. Never had much experience with sweet corn.

Q. Do you use the Canada peas?

A. Yes.

Q. How many bushels to the acre?

A. A bushel to the acre, with a bushel and a half of oats.

Q. How many bushels?

A. One bushel, or one and one-half bushels. It will make a good soiling crop to feed; something to carry the cattle over the dry weather.

Q. About stacking corn fodder; is it stacked like wheat and slants?

A. Just like stacking oats.

Q. Isn't great care needed in making it very slanting?

A. No, sir.

Q. How dry must it be?

A. Pretty dry, or it is liable to heat and damage.

Q. Cut in the field and cut when glazed, with a corn harvester?

A. With a corn binder.

Mr. Dalling: Had considerable experience with stacking corn and cutting it; always husk it I always stack my fodder. Tried shredding it, but I shan't shred again. I start in the middle and stack two bundles up to each other, and by keeping up the middle and not getting them flat you always keep the fodder where the rain will run off.

Mr. Mason: That's the way a stack has got to be made. If you want to keep it so, slant the middle; that gives it a way for the rain to run off and not spoil the fodder. If you keep the middle full and the sides lean from it, you will have no trouble.

A Member: I have tried the shredded fodder; I find I can get as much good in providing fodder not shredded as that that is shredded.

Mr. Mason: We like the round stacks the best. You have got to keep the middle filled; fill in the middle like stacking oats; it will come out easier than from a rick.

Q. Isn't your stack exposed more to the surface?

A. Put a good top on it.

Mr. King: It seems to me that with all this talk about stacking corn on the slant, that farmers ought to know that water won't run up hill. I have built many and many a stack of grain to the present date, and invariably when building a stack had that in view, that water won't run up hill. My stacks are slanted so they will shed water. We get our bundles slanted and then the water will run off. The question here is how to preserve it. I never found it so well as when left in the field and taken to the yard as we wanted it. If we get our profit out of it, it must be done with the smallest amount of labor.

Q. Then comes a big snow and thaw and freeze, and what then?

Mr. Mason: Then every stalk will be frozen down; you will have to chop it loose; a great deal will be wasted. Some winters during the past 20 years it would be literally impossible for weeks at a time to get it out of the field.

Mr. Coolidge: The agricultural stations tell us that corn fodder left in the field very long loses nearly 50 per cent of its protein for feeding. As a matter of convenience I have found in my experience that you want to stack your corn fodder when the corn is in it, and stack it outdoors. You don't want to stack it in the barn; if it is dirty, let it stand dirty. The rats, mice and manure, and these other odors that pass through the corn fodder, make it so the cattle will not eat it so well, so stack it outdoors. Fodder that is fed early in the year does good. You should stack fodder outdoors that will carry you through the bad days of the spring. There is no difficulty on earth in stacking corn fodder outdoors; no trouble whatever. The first of March and April I have enough corn fodder that I can feed during this season of the year. There is a whole lot of waste in corn fodder, but the waste is worth more per ton than the whole fodder cost you—good for bedding—and when scattered in your barns it tones up the bedding, easily absorbs liquid manure and your barns will be as dry in March and April as if you had a cement floor, and the cattle will not go covered with the manure.

Mr. Mason: Do you like shredded fodder as well as cut fodder?

A. The early part of the year, about two months in the spring, like shredded fodder; never tried cutting. I think corn fodder is the coming feed of the State of Illinois, and bound to take the place of hay.

A Member: Corn probably cut for early feeding can be fed cheaper from the shock than anywhere else in the world, but many days you all know it is stormy in the morning and frozen down. Have tried cutting, threshing and shredding. The ordinary threshing machine will do it faster and cheaper than anything else. I would rather have it than the cut corn. We have threshed 70 acres of heavy fodder in three days time easily, while a shredder that cuts in our neighborhood takes a third longer.

Mr. Mason: We stack corn so as we can get it out in January.

Mr. Allen: In speaking of stacking fodder you give the idea that it is husked?

A. Corn all in it.

Chairman: A bill of vital importance is now before the Senate commission at Washington, and while it interests the dairymen, it also interests every one concerned in the production of agriculture. I refer to the Grout bill. It is the reconstruction of the Grout bill by the Senate committee, and I will ask Mr. Grout, of Winchester, to speak to us on that bill.

Mr. Grout: I am very sorry that I have been called upon to champion the Grout bill. I hope none of you will think I am the author of that bill. I have been asked several times if that is the fact, but that is down in Egypt where they don't know any better. While I have nothing to do with that bill, and while I care very little for the dairymen, still I am in full sympathy with that bill—not because I sympathize with the dairymen, but because I am opposed to fraud and deceit of every kind. I believe that every tub ought to stand on its own bottom; that everything should be considered for exactly what it is worth. I know of no reason why there should be any contest over a bill of this kind. Now I represent the beef men of Illinois. I am interested in raising beef cattle, and it is claimed that the beef interests of this country will be greatly injured if this bill, known as the Grout bill, passes and becomes the law of this country. I do not know whether or not we would be injured, but that is no reason why that bill should not pass. If the beef interest of this country cannot flourish upon its own merits, let it fall. I know of no reason why a fraud should be perpetrated in order to bolster up any industry in this country. If I had known before I came here that I was to be asked to say anything in regard to this bill, I would have looked the matter up. While I have not taken any special interest in this bill, I decided at once that I was in favor of anything that would prevent a fraud. The people of this country are entitled to know what they can do. If they buy butter it is their right to know they are buying butter and not something else. If the people want to consume oleomargarine or butterine, they have a perfect right to, but they should know whether they are or not, and there is no reason why they should not know it, and why should not the law be so fixed they could know it if they want to?

I have no special sympathy with, and I don't like the dairying business. I took a great dislike to it in my early youth back in Vermont. I remember I was brought up on a dairy farm, and that is the reason. I remember when a boy about 8 or 9 years old my father and hired man went away. I brought up the cows to the lot as usual, and then I conceived a very brilliant idea to milk the cows, and I pitched in with a great deal of enthusiasm, and I succeeded in milking all the cows before they returned, and I was very proud, but I very soon had great cause to regret it. It didn't take long before I was pressed into service as a regular milker, and ever since that time I have taken no interest in dairying. But there are those who do take an interest in it, and it is their right that the product which they make should not be interfered with; that fraud should not be perpetrated upon them by an article introduced as butter that is not butter. Why, on the same principles we may go back and introduce the wooden nutmegs. If the people are willing to buy wooden nutmegs it is all right as long as they are willing and are not dissatisfied.

I look for the corn growers of Illinois to get up in arms and denounce our pure food law. That is I would if the pure food law were made to be enforced, but since listening to the speech of McKerick that is not the case. Those laws are made for the purpose of forming a commission, of having commissioners whose object it is not to enforce the laws of the State but to get away with the appropriations and furnish spoils to the administration. Pity it is, this is true, and a greater pity that the administration must have followers in their way.

Now then only a few days ago I attended an institute, and during a talk with an elevator man he informed me he received over $300 for the cobs. I asked him what became of them and he said he shipped them to a neighboring town where they were used to make hominy hearts. Here is where the corn men will raise a disturbance if the pure food law were enforced, because it wouldn't admit a thing of that kind and it would down the elevator man and all who help to make up a product to deceive the dairymen of Illinois. A fraud was perpetrated. Not that it is claimed there is no nutrive value in corn cobs. It is simply put in there to make up the bulk and deceive some one who ought to be protected. Corn cobs are all right in their place. If I go and grind them myself it is all right. I grind my corn cobs, husks and all, but I am not deceived. But when I want to buy corn cobs, I want corn cobs, and when I buy hominy hearts or bran I want to know what is good feed and what is not. That is not the only instance I have come across in the State of Illinois. Not long ago in talking with a gentleman about feed grinders he told me he had sold eight of them to one mill down in Egypt. They are grinding corn cobs with them. When I expressed surprise at the number he also told me of another mill that was shipping in cobs by the train load from Nebraska and we have a commission in Illinois for the purpose of stopping those things. That is why this Grout bill is an absorbing topic.

I am in favor of the Grout bill because it will tend to put a stop to deceit and fraud and I am in favor of the pure food bill that we have in this country if they will do what they were intended to do by those who made them.

Chairman: Mr. E. N. Cobb of Monmouth will speak a few moments.

Mr. Chairman: With what Mr. Grout has said regarding this bill I heartily agree. While I am in favor of stopping fraud, of preventing our getting oleomargarine for butter when we come to these conventions, I am fighting out my salvation individually by increasing our product and lessening the cost while we are waiting for this law. The gentleman spoke about testing different herds through the country and we are carrying out the work on our individual farms. I think that the greatest obstacle in Illinois today is the cow jobber. The man who brings a car load of cows into town. The farmers take their dry cows and sell them so much a pound and go down to the stock yards and pick out the cows they need to replenish their herds from the cows from Iowa, Nebraska and perhaps Minnesota. These cows are perfect strangers to these gentlemen and are taken home, and by the time they are acquainted with the cow she is a dry cow and ready to go to the butcher, and the same process is repeated.

Down in my county I was called a crank, a cow crank—they don't call me that any more. We have the special purpose cow. Our aim is to raise every animal that is destined to replenish our herd. We keep accurate account of every milking of each cow on milk sheets and these milk sheets are filed away so we can refer back at any time and ascertain what a cow has done. Her daughters are brought into the dairy. They are tested regularly with the Babcock test and their milk yield is recorded on the milk sheet and their disposition and their ability to assimilate food and make a profit is carefully looked after. In this way we are improving our herd year after year. We have something to look ahead to and something to hope for. If our milk cost $1.25 or $1 or 75 cents to produce, we try the next year to produce that for 5, 30 or 50 cents less.

While we are keeping these records of our cows, we are learning the best feeds to feed these cattle. In the past 12 months I will state, even with the drouth and extreme dry weather, we have made more money with our herd than ever before with the exception of one year, and that year was the time we had the war with Spain and we were near Chattanooga and got a large price for our product.

The food question is of more importance or as much importance as the breeding question. This winter and last fall at institute meetings and dairy conventions, it seemed to be the leading question, what shall we feed and where to buy it. We buy nearly all the ground feeds we use. Our rule is to ascertain the protein contents of the food and find the number of pounds of protein, and when we know the price per hundred we know what the cost is of the portein content in the food. We are long on carbohydrates in the State of Illinois, but short on protein. The protein in oats runs from 18 to

25 cents per pound, the protein in cotton seed meal is about 5 cents a pound, and all along the line you will find that a ration can be compounded by the by-products of the milk through the country and make a profit on the food we are giving to our cows.

In regard to the Grout bill that is before the Senate, I don't wish it to make our dairy products cost the consumer any more. That is no benefit. The benefit will be largely in favor of the consumer. There is no doubt but what the price received by the manufacturers for the oleomargarine products the profit is greater than the dairymen are realizing, and while I wish to have the consumer get good butter and get all he wants, even when butter is at a reasonable price, yet there is not enough good butter to go around, and I hope if there is a resolution offered it will be unanimously accepted.

By the President: I want to say a word myself about this Grout bill in which we are so deeply interested.

I know your people who are largely from the agricultural districts have no idea that it is sold for what it is, because your store-keepers are honest and tell the truth about it.

But it is not so in the larger cities. We sent out in Chicago and bought 84 pounds of butter from 84 different stores. They asked for butter and paid for butter. It was all sent to the chemist to be analyzed and 69 out of the 84 pounds was butterine, unmarked and unlabeled, and that is where the fraud comes in and what we are asking to be protected against.

The gentlemen who spoke to you last night, from Champaign, telephoned his grocer to send some butter. He knew the difference between them, and when it was sent he found out it was not butter. He telephoned and asked the grocer what he bought last night. He mentioned the articles and included butter. He asked him if he had sent butter, and he thought he had. He told him he wanted him to come up and get it because he hadn't sent butter but olemargarine. So you see they do go to the people even in country towns, and we asked and demanded this legislation that they put a stop to it; it is just and fair that we have it.

If the working man wants to eat it, we have reduced the price, or if the farmer wants it, he should have it without the tax on it. If the bill passes, they will get it two cents a pound cheaper. We simply want it sold for what it is. Those who want to eat it and ruin their stomachs, can do so, but they ought to know what they are buying, but I don't think any intelligent man ought to want to have it.

Less than three weeks ago a man in our county was sent to the hospital, and the doctor could not get anything to stay on his stomach, and he was no young doctor. He asked this man about himself, and told him, "I know what is the matter with you, you have been feeding around at these restaurants, and got your stomach lined with this oleomargarine, almost like a plating of glass," and it took him three weeks to make him well. Men who are in offices and in workshops do this same thing, and I want to tell you it is a serious thing to consider. If you will give a unanimous vote on this question, you will be asking for nothing but what is right and what is fair.

The following committees were appointed by the Domestic Science association:

Committee on Resolutions—Madames Blair, Yoeder and Ethel Turner.

Committee on Nomination—Mrs. Grundy ,Beal, Dyke, Davenport and Joiner.

Adjournment.

WEDNESDAY AFTERNOON, FEBRUARY 19, 1902.

Convention called to order at 1:30.

President: We will now be favored with a piano solo by Louis Schorn, "Concert waltz," by Wieniawski.

The committee on resolutions beg to report in part:

"WHEREAS, The boys on the farms in many portions of the State are taking an active interest in the cultivation of corn of the best varieties; and,

WHEREAS, The State and County Farmers' Institute can greatly promote this interest by the encouragement of corn exhibits at institute meetings, fairs and expositions; therefore, be it

Resolved, That the importance of giving more attention to the improvement of this leading cereal is such as to warrant the giving of liberal premiums for corn exhibits; and,

Resolved, That the boys of the State under 18 year of age be encouraged to grow the corn and make an exhibit of this cereal at the State fair and the Worlds fair at St Louis; and,

Resolved That the Illinois Farmers' Institute be, and are hereby, requested to appoint a committee to provide for the boys' exhibit at the State fair and World's fair at St. Louis, and provide funds for the expense of collecting and displaying said exhibit.

President: You have heard the resolution.

Delegate: I move to adopt the resolution. Motion seconded

President: It is moved and seconded that the resolution be adopted. All in favor make it known by saying aye. Motion carried

The committee on resolutions will report later, but we have one other resolution:

WHEREAS, The new Grout bill, known as H. R. 9,206, is now before the United States Senate, having passed the National House of Representatives.

WHEREAS, We believe the dairy industry of our state and the country need this protection, and that whatever benefits the dairyman is a benefit to the whole agricultural interests of the country.

Resolved, That we believe the said bill (H. R. 9.206) should become a law, and we request Senators Cullom and Mason to use every honorable means to secure the passage of this bill by the United States Senate; and

Resolved, The secretary of the institute wire these resolutions to our Senators Cullom and Mason.

I move the adoption of the resolution. Seconded

President: It is moved and seconded the resolution read in your hearing be adopted. Are there any remarks. All in favor signify by saying aye.

Carried, and resolution adopted

President: As the exercises this afternoon are devoted largely to the interests of the agricultural college, and as our vice-president, Mr. King, was chairman of the committee on legislation for building the college, and has been actively identified with it, and is now on the advisory board, I ask Mr. King to preside over the meeting. Vice President Mr King will take the chair.

Mr. King: It affords me a great deal of pleasure to come before this large gathering of farmers to talk on this question of the higher education of the farmers of this State If you will bear with me I think I can get up to where you can hear me as I am not accustomed to talking to such a large audience. I want to say the first object in view, as I understand it, of the Farmers' Institute of the State of Illinois, is the education of the farmer. There is no reason, so far as I can see, why we should expect the farmers of the State of Illinois, or any other state, to get along through this world without being educated. We expect every professional man in his line of work to be educated; every mechanic in his line of work to be trained and educated to that one particular thing, and for that reason I think we should look to the education of the agricultural masses. It is well at this time to look back over this movement for the education of the farmer. Since I can recollect now, the first move towards the education of the farmers of this State was made by Jonathan B. Turner about 50 years ago in Morgan county, Illinois. I remember the man very well. He was a first class man in every respect, and if he was living to-day he would be considered a "crank" on that subject. But he instilled that idea into the farmers of Morgan county and spoke of it at State fairs at Springfield along about 1856-7. There are some men here I guess who were there with me and heard him. It is still in the family. We have his daughter Mrs. Carriel, one of the trustees of the agricultural college in Illinois at the present time. But to get back further. Now since that time, the next move made in the interests of the farmers education was by a Mr. Morrill, in the United States congress, when the bill introduced by him was passed giving 4,800,000 acres of the land to the State of Illinois for the purpose of teaching in the agricultural school. That was in 1862.

In 1866 commissioners appointed by your Governor were traveling around over the State hunting for a place to locate the college. Now mark the strides. There were six cities trying to get the college, Decatur, Springfield, Jacksonville, Peoria, Bloomington and Champaign. I remember very well, the fight we made in Bloomington to get it located in our county, but Champaign won and the college was located there in '68.

Another stride. In 1898 this Farmers' Institute met at Champaign and found they had a fine university. They were very kind and showed us through all the buildings. Some were first class and when we got through some of the farmers present (I think about every county in the State was represented) asked where the agricultural college was. We didn't have it. There was no such thing as an agricultural college. You ask why, and the only reason is, as I understand it, that after they located and found the site the matter was turned over into other hands than the farmers and the farmers let the other men run it and they run it for everything else than an agricultural college.

At the next meeting of the Farmers' Institute they appointed a committee to go before the Legislature and ask for an appropriation to build an agricultural college building Now understand me, the first appropriation was only for the teaching in an agricultural and mechanical school. There was a clause which said not one cent of this money shall be used for putting up a buiding or even repairing. In 1898 the committee was appointed, and in the winter of 1899 the committee went before the Legislature of this State and asked for $150,000 to put up a building. When it was explained to the members they were glad to do it. They saw the necessity of it, and now there is one thing right here of which I ask a little help. That school has been growing. In 1899 we had about 12 scholars, now we have 183. I wrote a letter, as one of that committee that went before the Legislature and asked for the appropriation for the building and told them why I wanted it. And they said when you get this appropriation you can't get the boys to go there, and I pledged them if they would put up the building the farmers would fill the building with boys and girls. We have the building and it is equipped, and I want to ask every delegate and every farmer to talk that matter up with the boys and girls of his neighborhood and let them know we have a school where we can teach the boys all the branches of farming, and the girls all the branches of cooking and housekeeping, and I can't give you any better reference of the work the agricultural college can do than to refer you to the young man who told you this morning what he was doing. He was evidently educated in his line of work and gave us a very interesting and profitable lecture. I not only say this to the delegates, but to the farmers and directors. I am satisfied that the directors that belong to this institute are not keeping up the interest that they ought to. I don't think they are talking the matter of the education of the boys enough in this State. I have tried to do it in my district. I had six in my district in that school, and I had to go outside and borrow 20 counties to get my boys in, and I think the other directors can do just as well if they undertake it.

We are now ready for all the boys and girls you can send to us.

We will now listen to the annual address of our president, Mr. Walter R. Kimzey.

ANNUAL ADDRESS OF PRESIDENT WALTER KIMZEY, TAMAROA, ILL.

It is with great pleasure that I appear before you this evening after the send off that the Farmers' Institute was given by Col. Mills yesterday. After telling what has been done, it is with a great feeling of comfort that we contemplate the rapid advancement, and it is such as to make anyone stop and think, what next?

Four years ago I was first placed on the board of directors, and at that time less than one-half of the counties of Illinois held institutes. Now, not alone has each county an institute, but many have two, three, four and some 12 institutes a year, and instead of the politicians of the county being afraid of some political scheme they are coming right to the front and pushing it along. The boards of supervisors are making appropriations to assist in holding the institutes so that the Farmers' Institute work in the State is almost past its toddling age, its infancy, and is now entering upon the second stage of its life. What can we not expect yet to accomplish?

Looking before me this evening with the floor of this opera house filled to standing room and the gallery partially filled, and then look back two years ago to the institute at Princeton where the middle aisle would have held all, it shows the vast increase of the work. Taking the Farmers' Institute work as a whole, we started as Col. Mills told yesterday with the county institutes poorly attended, but now well attended in nearly every county of the State, and now we hope this is only a step to even better things. We hope from the general county meetings to have sectional meetings in every corner of the counties and take the work to the people so that all may have the advantage of it. Go from the sectional meetings to the township meetings and from the township meetings to the community meetings. We aim to reach all the people. The institute is not for a favored few. It is for the girls and boys as well as the mothers and fathers. Take the institute to the people. When we do that we will reach one of the great aims we hope to reach.

In some states the farmers' clubs are accomplishing a great and glorious work. In southern Illinois—of course this is not true of northern Illinois—but in southern Illinois the farmers do not always have their farms in as good a condition as it might be. Some of the machinery that is not ready to be discarded is left out in the weather. These farmers' clubs, as carried out in some places, and as the committee of the State of Illinois Farmers' Institute would recommend, are composed of a limited number of families, probably 12, more if you choose. Suppose a limited number of families hold one meeting a month at the home on the farm—not at some town hall—but with the family on the farm. Let the men go about and examine the farm. See the condition of affairs. How the place is kept up and the work done. Let the women go about the house and investigate the household work. Each wife probably has some special receipt for jelly or jam, or can tell how to make a mixture of peach juice and apple juice so as to get the right consistency. These are the things the women can be discussing while the men are on the farm seeing the work there. If the meeting was to be held with you, do you not think your farm would be in better condition than it might probably otherwise be. I know it would be at home. I think it would be with you. There would be probably a fresh coat of paint or whitewash on some of the buildings. Would not the home where the woman would be, be in better condition? These are merely things that we are yet hoping to reach with the Farmers' Institute work. So far in the club work we aim to reach merely the men and women. How about the boys and girls? We have now over 100 cases of the institute library in circulation in the State of Illinois and being read and called for and with some 40 applicants ahead. With that as a nucleus for literary work for the farmers' clubs, why can not the boys and girls in the evening after the close of school have essays on different topics by some, a book review by others and afterwards a good social time? Will not that reach your boys and girls and give them some home comforts and social enjoyment as well as something beneficial? What other states can do, Illinois can do.

The rapid advancement of the institute work shows what can be done and we hope to do these things in the near future. These are the things that will make institute work of direct benefit to us. As our President Roosevelt stated in his last annual message, "The farmers must organize"—not organize politically but for our own good.

The old F. M. B. was a splendid organization before it got into politics. The Farmers' Alliance, the Farmers' Social and Economic Union are all places where the farmers can meet and discuss things of general interest. If you will keep politics out of the association, discuss points of interest to you, then you will make a success of the work.

One great trouble under present conditions is that Mr. Smith in a community is especially prosperous, Mr. Brown does not have quite such good success in his work. Instead of praising the successful neighbor he is always trying to detract. There seems to be so much jealousy among the farmers.

With our clubs free and open to all, boys, girls and women, have your organization open for discussion of various plans and these people can be reached in a way not accomplished by any other method. We hope to help reach them from the State institutes, building up from that work. We must not neglect the Domestic Science associations. In many of the counties that work has not yet been introduced successfully, but where it has the more ladies we get out to our institutes the better interest we have and the greater is the success of the institute.

The social life on the farm is another thing that probably is not though of. From the Farmers' Institute standpoint and in the Domestic Science work not alone should questions of cookery be discussed but home environment, and I am glad to see that they are on the list as suggested by the State committee. Discuss the beautification of the home, the sanitary conditions and do not forget the boys and girls. In any community if the neighbor children come in, if you know they are coming, a pleasant time is planned, corn is popped or candy pulled. How many boys and girls right in the home and such things never though of. Is it not often pleasures are reserved for the neighbor children and your own boy and girl—of course you love them—they know it. Is it not necessary if you care to keep the boy at home on the farm, away from town, out of the saloon, away from all questionable resorts, to make the home life more pleasant, more enjoyable for him? The father should lay his paper aside one night in the week, and the mother, after the dishes are done, should lay her knitting and sewing aside and spend one evening out of the seven in social enjoyment with the family. Make them think you are interested in their social welfare. This can be realized through the Domestic Science as fully as the institute work. There should be interest not alone in the culinary but in the social side of farm work.

Along this same line, and now being conducted successfully in a few towns of Illinois, not many but in a few, is the waiting room in the town for the country woman. Probably a new thought to many of you, but where you are married men, if you go to town to trade, your wife with you, she probably finishes up her errands first. Where do you leave her? Standing around leaning against a counter somewhere when she is already probably tired and worn. In a few towns a regular waiting room has been established.

The business men look at it from a financial standpoint and maintain a place so as soon as her work is through she can go to the waiting room and have a chance to rest while the farmer is finishing his work. If you do not call for it, do you think they are apt to go to the trouble on your behalf? Look not alone to your own comfort but to the ladies, as well.

That is another thing that the Farmers' Institute will bring about. Where there are public libraries and reading rooms it can be held along with them. But these things take time. Imagine your wife standing an hour or two while you are at the blacksmith shop having some work done, or possibly at the elevator, and then on your return home it is her duty to get the meals when she is all tired out. It is only a step in the right direction in the work of the Domestic Science ladies.

The most important feature is the educational phase of the Farmers' Institute. In our neighboring state, Wisconsin, realizing the demands made by the schools for agricultural, it has been put upon the required course of instruction in all the public schools. The State Superintendent at his annual State convention outlines the work for the institute work. In the county institute it is taught to the teacher and they in turn put it into practice. Before the teacher is licensed they are examined on the work. This can not come until the farmers are ready for it. Aren't we ready for it? In New York state a different plan has been tried. There under the direction and assistance of an able corps, the Cornell reading courses are prepared and sent throughout the state to farmers, and a special course for those who meet in the clubs and discuss the pamphlets issued and discuss the work there and it is of great advantage to them during the winter months. But it reaches the children also. Questions of soil germination and various question of this kind are placed in pamphlet form and sent out and studied under the direction of the teachers and they become interested in the wonders of nature lying all about them. What has Illinois done? Until two years ago, there was apparently little or no call for anything of this kind. About three years ago, in Wayne county, through the Farmers' Institute, the county superintendent was interested in the first principles of agriculture, and it was asked of the superintendent to teach it through the schools and today nearly every country school of Wayne county has more or less work in the study of agriculture. In other places work along this same line is being accomplished.

The State College of Agriculture at Champaign, realizing the demand of this kind, have issued pamphlets which have been distributed. The simple question of smut in oats is of vital interest to the farmer. It causes a loss of one fifth or more in the yield a year, and yet there is a simple treatment to prevent this. That is only one of the questions treated. The State Teachers' association through their committee have seen the coming call for this and in their course of studies two years of work is now outlined in their work. But what use is this if the farmers of the neighborhood themselves do not wish for it? So many country schools select teachers on the basis of the lowest bidder feeling the school like the building of a bridge should be let to the lowest bidder. And many of the town girls—with all respect to them, being required by the city boards of education to have experience before they can be selected as teachers in the city schools go the country schools to teach. Their ideas are all of the city life, their fine times, some of them are—not all—full of the subjects of beaux they have in town. Country girls do not have so much. They speak of the parties, dress, etc. The boys and girls, if they like their teacher, pattern after the teacher. Which pattern is best?—the teacher who resides in the country on the farm, that has learned to love the development of the seed from its earliest development up to the fruitage in Illinois, the study of the wondrous changes in nature all around them, their teacher in close touch with the home environment. The teacher who knows what the child means when he speaks of the father sowing oats. Is not the latter what you want?

In the dairy community a teacher who is able to point out to the boys especially and the girls also the difference in keeping cows that milk six months and are dry six and the few that will milk 11 of, the cow that will test 3 per cent and the cow that will test 4½ or 5 per cent butter fat. Will not that teacher interest your boys and girls in the work at home. Teach them to look for things at home in the barn and field. If a teacher can take an ear of corn and show them the difference between a long ear like that and the shorter ear where the rows have a wider space and a fewer number of rows with the deep kernels and the butts well filled. Would not that teacher instill in the girl a difference that will pay you?

If the teacher goes a step farther and shows how thorough cultivation is apt to hurt in a dry year making the land dry out. If the teacher put into your schools can tell the children these things, is not that a help to many of the farmers as well as the boys and girls? It must come through the Farmers' Institute.

Take it farther south, in the great apple belt, spoken of yesterday by one of the speakers, where apples are shipped direct to the markets of European cities, loaded in cars in the stations and unloaded at Baltimore or New York for shipment abroad. In these communities if the teacher is able to speak of the necessity of a thorough cultivation of the farm for plums, apples, peaches, etc., and the need of spraying which can be done at a small cost and greatly increase the value of fruitage, will not that help the farmer and benefit the boys and girls? Other things being equal, for country schools we want country teachers. These are the things that the Farmers' Institute must call for and they will have. From a financial standpoint also a teacher that will be interested in the same line of work, and the teacher that will teach your boys and girls the wonders of nature—for they are truly wonderful—that teacher will be worth dollars where the other teacher is worth cents. These, therefore, are some of the things to be striven for that we are holding up before the Farmers Institute. In a few years from now, you will say: "Kimzey, you stopped too low; you didn't place that high enough."

In closing let me again urge the organization of farmers, for discussion of questions of practical interest to them—to you. The township, county, congressional and State meetings; the Domestic Science work; that can be taught in the schools. The women's rest for the women in towns. These are all matters the Farmers' Institute can reach forward to, and it will be but a few years before we can attain them.

Chairman: I don't want the audience to think in inviting the boys and girls, that we wish to exclude the town and city boys and girls. We are willing to take them all in. We want all those to come that will select this work for their profession in life and I am satisfied most every boy has a choice. I know I have. I always resided in town and never lived on the farm until I was 18 or 19 years of age, and my choice was the country and I rented a little piece of ground and for 50 years I have been raising corn and I have no reason to regret the choice I made 50 years ago. There is no life like that of the farmers. When he comes home from the town to the farm he can rest. Judging others by myself.

Q. Is there any chance at Champaign for old boys?

A. It is 16 years of age and over.

Q. That would include me?

A. You can be the judge, sir.

NOTE—That the reports of the committees which followed may be more fully understood we publish the text of Bill 315 in full.—SECRETARY.

AN ACT *to provide appropriations for the equipment of the college of agriculture and the extension of the work of the agricultural experiment station.*

WHEREAS, The State of Illinois has made no appropriations for the equipment of the agricultural college or the conduct of much needed experiments provided for in this bill; and, WHEREAS, The Forty-first General Assembly made provisions for the construction of a building for the college of agriculture; and,

WHEREAS, The preliminary arrangements made for the enlargement of the work of the college of agriculture have resulted in the increase in number of agricultural students by more than five hundred per cent; and,

WHEREAS, The pressing demands for a larger corps of instructors, and the enlargement of the course of instruction by the farmers of the State, necessitate greatly increased facilties for the college of agriculture; and,

WHEREAS, Illinois is possessed of unlimited crop and live stock interests, existing under soil and climatic conditions, the most varied and not yet fully understood, and with market conditions most favorable, yet whose exactions and changes are not sufficiently well known; and,

WHEREAS, Certain conditions in the agriculture of the State demand early and particular attention for reasons of public welfare, notably the character and remedies for certain soils known as bogus, dead-dog, hard-pan, etc., and the known fact that milk is produced under more unsanitary conditions than any other article of human food, directly concerning every family of every city and town in the State; and,

WHEREAS, Whatever contributes to the development of the agriculture of the State adds to its revenues and becomes a permanent investment, both public and private; therefore, be it

Resolved, By the various live stock and other agricultural organizations of the State named in this act, that the General Assembly is hereby petitioned to meet the pressing demands of the farmers of the State for the funds necessary to provide the equipment and conduct the experiments outlined; and, therefore:

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That it shall be the duty of the college of agriculture to maintain typical specimens representing the various market classes and the several pure breeds of live stock, and to give expert instruction in stock judging, and in the most advanced and approved methods of live stock husbandry.

That it shall be the duty of the agricultural experiment station to conduct feeding experiments intended to determine the most successful combinations of stock foods, particularly in Illinois grains and forage crops, and to discover the most economical and successful methods of maintaining animals and fitting them for the markets; to investigate live stock conditions, both at home and abroad, in so far as they affect market values, and to publish the results of such experiments and investigations. That to carry out the provisions of this section there be, and hereby is, appropriated the sum of sixteen thousand dollars ($16,000) annually for the year 1901 and 1902, of which sum eight thousand ($8,000) is to be set aside annually for live stock feeding experiments, etc.: *Provided*, that the work undertaken and outlined in this section shall be carried out on lines to be agreed upon by the dean of the college of agriculture, and a committee of five to be appointed by the Illinois Live Stock Breeders associations.

§ 2. That it shall be the duty of the agricultural experiment station to conduct experiments in the several sections of the State, in order to discover the best methods of producing corn on the different soils and under the various climatic conditions of the State, and for the purpose of improving the varieties grown for special purposes, combating insects, enemies, etc., and that, to carry out the provisions of this section, there be, and hearby is. appropriated the sum of ten thousand dollars ($10,000) annually for the years 1901 and 1902: *Provided*, that the work oultined in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five to be appointed by the Illinois Corn Growers' association, the Corn Breeders' association, and the Illinois Grain Dealers association.

§ 3. That it shall be the duty of the agricultural experiment station to make chemical and physicial examinations of the various soils of the State, and to determine the character and location of their several classes; to ascertain what crops and treatment are best suited to each; whether the present methods are tending to the preservation or the reduction of their fertility, and what rotation and treatment will be most effective in increasing and retaining the productive capicity of Illinois lands; and that, to carry out the provisions of this section, there be, and hereby is, appropriated the sum of ten thousand dollars ($10,000), annually, for the years 1901 and 1902: *Provided*, that the work outlined in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five be appointed by the Illinois Farmers' Institute.

§ 4. That it shall be the duty of the agricultural experiment station to discover and demonstrate the best methods of orchard treament in the fruit sections of the State, and the most effective remedies for insect and fungous enemies to fruits and trees; and that, to carry out the provisions of this section, there be, and hereby is, appropriated the sum of ten thousand dollars ($10,000) annually, for the years 1901 and 1902: *Provided*, that the work undertaken and outlined in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five to be appointed by the Illinois State Horticultural society.

§ 5. That it shall be the duty of the agricultural experiment station to investigate the dairy conditions of the State, and to discover and demonstrate improved methods of producing and marketing wholesome milk and other dairy products; and that, to carry out the provisions of this section, there be, and hereby is, appropriated the sum of five thousand dollars ($5,000) annually, for the years 1901 and 1902: *Provided*, that the work undertaken and outlined in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five to be appointed by the Illinois Dairymen's association.

§ 6. That it shall be the duty of the agricultural experiment station to investigate and demontrate the best methods of seeding, cultivating and marketing sugar beets on the various soils to be found in the several sections of this State; and that, to carry out the provisions of this section, there be, and hereby is, appropriated the sum of three thousand dollars ($3,000) annually, for the years 1901 and 1902: *Provided*, that the work undertaken and outlined in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five to be appointed by the Illinois Sugar Beet Growers' association.

§ 7. That the committees representing the several associations herein named shall meet annually at the college of agriculture at Urbana, at such time as may be designated by the dean of said college, that they shall serve without compensation except for expenses, to be paid out of the respective funds, and that said committees shall make to their respective associations, at their annual meetings, full reports of the work in progress under the provisions of this act.

§ 8. That the Auditor of Public Accounts is hereby authorized and directed to draw his warrant on the State Treasurer for the sums herein appropriated upon the order of the chairman of the board of trustees of the University of Illinois, countersigned by its secretary, and with the corporate seal of said university: *Provided*, that no part of the funds herein appropriated shall be used for salaries of teachers: *And, provided further*, that any revenue arising from the operations of the several sections of this act shall revert to the respective funds from which obtained for further extension of the work outlined. Nothing herein contained shall be deemed to take away from the board of trustees of the University of Illinois the usual authority conferred by law over the expenditure of moneys appropriated to said university. The recommendations of the commitees therein provided for shall be advisory, but the use of the moneys herein appropriated shall rest in the discretion of said board for the purposes herein set forth, and said board shall account therefor.

APPROVED MAY 10, 1901.

REPORT OF LIVE STOCK INVESTIGATION AND EXPERIMENT.

By Mr. A. P. **Grout**, Winchester, Chairman.

Mr. Mumford has sent 50 pages and asks permission to print them. There is one thing I would like to say. I have been connected with the Farmers' Institute work of this State for six or eight years, and there is one thing that strikes me perhaps more forcibly than anything else. I refer to the good work being done by the institutes of this State. Four or five years ago when we asked them to pass resolutions asking for an appropriation of money for the agricultural college there was scarcely an institute where we didn't meet with some opposition. The old farmers would want to know what the agricultural college had done, what benefit it was and what those professors really knew about agriculture. The idea they intended to convey was that no man knew anything unless he actually lived on the farm. And in many places serious objections were made to the agricultural college. It was not in good favor. They had no faith or confidence of any good ever coming from the money appropriated to that purpose. That was four or five years ago. And not only that, but you would hear sneering remarks of everyone connected with the agricultural college. If they came to speak to them they would hardly listen to them with respect, but that has entirely changed in the State of Illinois. I have not during the last season heard one sneering remark made of any of our professors or the work done. If the farmers are not all converted they are not saying anything. We have gotten that far. They are learning enough to know there is something in it. And frequently some of the boy professors teach the old gray-headed fellows in ten minutes more than they have learned in the lifetime, and they have to admit it, and I think that is one of the helpful signs of the State of Illinois—that people have quit looking down on the agricultural college and are looking to it for the information they desire.

Over in Ohio, I think it was, a professor went out and took dinner with an old farmer. On the table they had some fine butter which they discussed and admired. The farmer said it had taken him 40 years to learn how to make that butter, and the professor told him he could teach him all that in six weeks. What it has taken some of the old farmers a lifetime to learn can now be learned by our boys in a few weeks.

As you know the last Legislature made an appropriation for the purpose of making certain experiments at the State university. Now then the farmers, some of them, think they know all of these things, but there may be a question on one thing they do not know, and life is too short to attempt to find that out for themselves, but these things can be carried on at the institution so as to enable them to find out these things. In carrying out this work the committee we appointed have met and mapped out a course to be followed and it will give you the program marked out. This is all we can do at present because we have not the results at this time.

AN OUTLINE DESIRABLE.

First—That there may be unity throughout our work; and second, that no pertinent question relating to the industry involved should escape our attention.

The outline is made as brief as possible, and an effort made to clearly distinguish between the end to be reached and the manner of reaching that end. In other words, between the questions it is desirable to settle and the method of settling those questions.

It would seem, therefore, logical to first canvass the broad field of live stock investigation and experimentation and classify the disputed or neglected questions, and second, consider ways and means of collecting data which shall throw some light on these problems, if not suggest or discover an absolute solution.

It was this thought that led up to the preparation of the outline submitted in this paper.

Live stock investigations and experiments should, as far as possible, be undertaken from the view point of the consumer of meat. Believing that the fundamental proposition is: "Are we producing a maximum of what the people want at a minimum cost with residues disposed of to the best advantage?"

Besides conducting experiments calculated to establish certain facts, we should also institute investigations to ascertain the present state of knowledge and belief which represents the accumulated experience of generations of stockmen, regarding the points in question.

I. FEEDING EXPERIMENTS AND INVESTIGATIONS.

1. Converting the corn crop into *meat.*
   - (a) Preparation of corn.
   - (b) Supplementary feeds.
   - (c) Treatment of animals as meat producers.
   - (d) Is the treatment of animals as meat producers incompatible with the treatment of the animal whose function is to breed meat producers?

II. MEAT ON HOOK AND HOOF.

An exhaustive study of meat because such study is indispensable for the purpose of establishing standards of judging animals on the hoof.

III. DISSEMINATION.

1. Bulletins.
2. Circulars.
3. Class room.
4. Agricultural press.

After canvassing the whole field for investigation as above outlined and after carefully considering experiments suggested by the members of the committee and the animal husbandry department, the following work was decided upon for the present year:

AN INVESTIGATION OF PRESENT METHODS OF BEEF PRODUCTION.

That this investigation should bring out the present practice concerning: (a) The preparation of the corn crop to fatten steers. (b) The use of supplementary feeds. (c) The treatment of animals as meat producers, or, in otherwords, the care and management of steers or heifers which ultimately find their way to the open market. (d) The treatment of animals from which breeding animals are to be selected.

In accordance with the above decision the animal husbandry department is sending out the following letter and accompanying list of questions to a very large number of prominent and successful cattle feeders:

Animal Husbandry Department—Form No. 5.

DEAR SIR—The animal husbandry department of the University of Illinois is collecting information upon the methods of beef production. It is doing this with a view of determining; first, all the methods in use; second, which are most profitable; third, which produce the highest classes of beef; and fourth, which result in products able to compete most successfully with those produced by the same or different methods in other states or countries; finally to answer the question, "How can beef production be rendered more profitable?"

The success of this investigation depends upon the willingness of the people actually engaged in the business to give the facts. I know that this means some trouble, but each will learn something and the beef producing interests will certainly be benefited.

I have therefore, taken the liberty of addressing the questions on the accompanying blank to you with the request that you give them careful consideration. We know you are a busy man, but at the same time we feel assured that you are deeply interested in this question and I am sure will coöperate with us.

We hope to publish a bulletin containing the results of these investigations and will take pleasure in forwarding a copy to you as soon as issued.

Very truly yours,

HERBERT W. MUMFORD.

Animal Husbandry Department—Form No. 6.

PRESENT METHOD OF BEEF PRODUCTION.

(A blank space is left after each question for answer; if you need more space kindly answer questions on the back of this sheet, being careful to accompany answer with the corresponding number of the question.)

1. Do you buy your feeders or breed them?..............................

2. If you breed them what class of cows do you keep; i. e., are they largely of beef blood, and if so, of what breed?..............................

3. Is the bull pure bred?............ If so, of what breed?............

4. Do you ever practice in-breeding?..............................

5. At what age do you breed the heifers to produce market stock?........

6. At what season is the principal crop of calves dropped?...............

7. Do you intend to make baby beef of them?..............................

8. If so how long do they suckle their dams?..............................

9. Do they get grain while suckling their dams, if so what kind and how much?..............................

10. At what age do you castrate calves?..............................

11. Do you keep the heifers until they have reached maturity?............

12. At what age do you finally sell the cows; at what season, and in what condition?..............................

13. How do you manage the calves intended for baby beef from weaning time until marketed?..............................

14. How long do you permit calves to suckle dams when not intended for baby beef?..............................

15. Do you feed any grain to such calves when suckling their dams?.......
....

16. In buying stockers or feeders what age, weight, breed and condition of flesh have given you the best returns? (a) Age............ (b) Weight .... (c) Breed............ (d) Condition of flesh..................

17. What margin over cost price do you consider necessary in order to make your feeding operations come out even, on a basis of 35 cent corn and $8 hay, under average conditions of buying and selling your cattle; that is, that you shall neither gain nor lose by the enterprise?......................

18. What margin over cost price will give you a satisfactory profit?......
....

19. What breed has given you the most general satisfaction and why?
....

20. What season have you found best for buying stockers?...............

21. What do they cost per pound delivered at your farm? ....

22. Where do you secure your stockers as a rule and why?................

23. Do you ever feed spayed or open heifers?............................

24. Have you been able to realize as much profit from feeding them as steers?..

25. How long do you plan to feed?............................

26. Have you found winter feeding profitable?........................... If not, why not?...

27. What season of the year can you fatten cattle to the best advantage and with the most profit?...

28. As a result of your experience what do you consider the best length for the feeding period? (This refers to the number of days on full feed.).... ....

29. At about what age and weight do you aim to market your cattle, assuming of course that you market them when they will give you the greatest net profit? (Age)...................... (b) Weight......................

30. Have you found it profitable to produce 1,500 to 1,600 pound steers; if so, under what conditions?...

31. At approximately what date do you turn your cattle to grass?.........

32. Do you run the cattle on pasture in July and August?...............

33. If so, do you feed them any other green feed?......................

34. How many months do you pasture your cattle intended for market?....

35. What kind of pasture do you provide for your cattle?.................

36. How many acres of pasture named above, in an average season, are sufficient to carry: (a) Twenty two-year-old steers............ (b) Twenty yearling steers............ (c) Twenty cows or heifers with calves at foot ....

37. When do you aim to get the cattle on full feed?.....................

38. When are they taken off the pastures?...............................

40. Where and how do you sell your cattle?..............................

41. What particular care, if any, do you take before shipping cattle to market in order to have them reach the market with light shrink and in the best possible condition? (a) In summer from grass............ (b) In winter from feed lot............

42. Will your local butcher handle some of your best cattle, or does he handle a cheaper grade?...

43. Does he handle your culls and old stock, or do you ship them?........

44. What class of beef do you attempt to produce?.......................

45. What prices have you received when sold at home? Date........1898, price........ Date........1899, price........ Date........1900, price........ Date........1901, price........ Date........1902, price........

46. If you have shipped, what prices at the market? Date........1898, price........ Date........1899, price........ Date........1900, price........ Date........1901, price........ Date........1902, price........

47. What season have you found best for marketing your fat cattle?......

48. Do you use the self-feeder?...

49. If so, what are its advantages?.......................................

50. What are its disadvantages?...

51. Do you feed in sheds or in the stall, in pens or open field?............

52. Would you under any circumstances advise feeding cattle in the open lot without shelter of any kind?..

53. Do you believe any better results could be secured if steers had access to a closed shed or warm barn?...

54. How many steers do you run in a feed lot together?..................

55. In fattening cattle in winter do you think it advisable to give access to good blue grass pasture during open weather or confine them to the feed lot?..

56. Do you use rock, (lump) or barrel salt?..............Why?............

57. Do you keep salt before your cattle at all times or salt them at regular intervals?..

58. What provision, if any, do you make to keep feed lots from getting muddy during broken weather?..

59. What average daily gain do you secure: (a) In summer on full feed and grass............ (b) In winter on full feed............

60. (a) Taking the whole of the grazing season through what average daily gain do you secure with yearlings on grass alone?............... (b) Two-year-olds on grass alone?................

61. At what age do you find it pays to put steers on full grain feed?......

62. What is the best method for wintering steer calves; *i. e.*, from weaning time to grass in spring?..

63. What is the best method you have found for wintering yearlings?......
....

64. How many days do you take to get steers unaccustomed to grain, on full feed?..

65. State briefly your method of feeding steers during their fattening period, including feeds used and the number of feedings per day............
....

66. What disposition do you make of the corn stalks or stover?...........
....

67. Of the feeds used, what do you aim to produce?........................

68. What feeds, if any, do you buy?..

69. State your experience in feeding cotton seed meal as to amount fed to each steer, and results?..

70. Have you found it undesirable to run hogs after cattle receiving cotton seed meal?..

71. In your experience have you found it profitable to feed any bran or linseed meal with corn? If so, which one and in what quantities?...........
....

72. Have you used other grains with corn, such as gluten meal, flaxseed meal, germ meal, malt sprouts or brewer's grains? If so, in what quantities and with what results?..

73. When steers are on full feed what roughage do you prefer and why?
....

74. Do you allow the steers all the roughage they will eat during the fattening period?..

75. If not, why not, and what kind and about how much roughage do you feed?..

76. Do you vary roughage in an attempt to make steers eat more of it?
....

77. If you have had any experience in feeding silage to fattening steers, kindly state briefly the results which followed such feeding.................
....

78. How do you feed your corn; that is, in shock, snapped, in the ear husked, broken, or shelled? Do you crush, crack, grind, or soak your corn? (a) Winter feeding. (b) Summer feeding..
....

79. Why do you prefer the method of feeding corn you practice?........
....

80. Do you make a practice of feeding grain to cattle on grass? If so, during what months? (a) Months.. Kinds.............................. Amount..............................

81. What amount and kind of grain do you ordinarily feed per day per head when on full feed? (a) Yearlings in winter........................... Yearlings in summer on grass........................... (b) Two-year-olds in winter................. Two-year-olds in summer on grass..............

82. Do you run hogs behind your cattle?.......................................

83. If so, how many 150 pound shoats do you consider will thrive well per steer on what they can secure from the droppings of the steer and without additional corn being given them? ....

84. What average daily gain do you secure on pigs with this method of feeding? ....

85. What shelter do the pigs have? ....

86. What age, breed, and weight of hogs do you prefer for following steers in the feed lot? (a) Age.............................. (b) Breed.... .... (c) Weight..............................

87. Do you aim to keep just enough pigs following steers to consume droppings, or do you plan to feed pigs something besides what they get from the droppings?...

88. When a thousand bushels of ear corn is fed to cattle in the ordinary way, what proportion of it would you consider fair to be charged up to the hog that follows the steer?..

89. Have you found that the feeding of oil meal to the steers has been a decided advantage to the pigs following the steers?.............................

90. Have you fed any other supplementary feed to the steers that has had an equally good effect upon the pigs?.......................................

91. Do you consider it advisable to warm water for cattle during the winter months any more than to keep tanks from freezing when exposed? ....

92. As the result of your experience, what method or combination of methods of preparing the corn crop has returned the greatest profit, everything considered, and why?...

93. How much grain and how much hay do you estimate it takes on the average to produce 100 pounds of gain on—

(a) Calves, in winter, ...bushels corn, ...pounds hay.
Calves, in summer on grass, ...bushels corn, ...pounds hay.
(b) Yearlings, in winter, ...bushels corn, ...pounds hay.
Yearlings, in summer on grass, ...bushels corn, ...pounds hay.
(c) Two-year-olds, in winter, ...bushels corn, ...pounds hay.
Two-year-olds, in summer on grass, ...bushels corn,.....pounds hay.

94. How many years' experience in feeding steers have you had?.........

95. During this time, how many cattle, approximately, have you fattened and marketed?...

96. Can you produce beef at a profit at present prices of food and fat cattle?... If so, how would you manage it?...

97. What is the average price of land upon which you grow and fatten cattle?...

98. Is land increasing or decreasing in value in your section?............

99. Is cattle breeding and feeding increasing or decreasing in your section, and why?...

100. In your judgment, what changes of conditions are most necessary in order to render beef production more profitable?..............................

Name..................................
Post-office ....
County ....
State ....

NOTE—We do not expect, except in rare instances, that any one feeder will be able to answer every one of the above questions. Inability to answer all should not deter any one from answering such questions as his experience makes possible. It is the feeder's experience, his success first, and his failures last, that we want most. H. W. M.

It is not intended that this investigation shall be confined to Illinois producers of beef, but shall extend at least as far as to producers of beef in other states whose cattle come in direct competition with those marketed from Illinois farms. This is by far the most thorough and extensive investigation ever undertaken by any experiment station of any state in the Union.

When the replies are received they will be tabulated and arranged in bulletin form for the benefit of beef raisers in Illinois.

A STUDY OF MEAT IN PACKING HOUSES AND MARKETS.

Believing that no man can intelligently produce high quality in meat, or in other words produce meat which will in every way meet the demands of the consumer, without first knowing the characteristics of good meat, the Experiment station has begun a study of beef.

Six fat steers have already been killed which were first carefully studied on foot as to form, quality, condition and market requirements, not only by the department but also by recognized experts including a prominent cattle salesman of Chicago; the same steers were then sold to Urbana and Champaign butchers and the butchers' verdict secured as to the profitableness of each carcass from the butchers' standpoint. Circular letters accompanied each cut of meat to purchaser and consumer to ascertain in each instance whether the beef from certain carcasses was entirely satisfactory.

A record was kept of the percentage of fat and dressed beef in each steer, the relative weights of the different cuts, weights of lungs, livers, hearts, tongues, heads, feet and hides were also kept.

Animal Husbandry Department—Form No. 1.

CARCASS NO................

Name of Part.	Weight in Pounds.
Live weight	....
Dressed weight	....
Internal fat..............................	....
Suet or kidney fat	....
Hide..............................	....
Tail	....
Offal	....
Feet	....
Head..............................	....
Lungs..............................	....
Heart	....
Liver..............................	....
Tongue	....

Animal Husbandry Department—Form No. 2.

FORE QUARTER.

Carcass No. ....

Name of Cut.	Pounds in cut.	Price per pound.	Total value of cut.	Pounds waste to consumer.	Pounds waste to retail butcher.
NECK—					
Boil					
CHUCK—					
Steak					
Chuck Roasts					
PRIME OF RIB ROAST—					
Round boil					
(Arm or Shoulder)					
RIBS PLATE—					
(Plate Boil)					
SOUP BONES—					
MISCELLANEOUS—					

Animal Husbandry Department—Form No. 2.

HIND QUARTER.

Carcass No. ....

Name of Cut.	Pounds in cut.	Price per pound.	Total value of cut.	Pounds waste to consumer.	Pounds waste to retail butcher.
Porterhouse—					
Large Heavy..........	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
Short..........	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
Sirloin—					
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
Rump—					
Roasts..........	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
Round—					
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
Flank Steak—					
....	....	....	....	....	....
....	....	....	....	....	....
Soup Bones—					
Knuckle..........	....	....	....	....	....
Shank..........	....	....	....	....	....
Miscellaneous—					
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....

Animal Husbandry Department—Form No. 3.

To the Purchaser:

This cut of beef was taken from an animal fattened on the university farm. In order to secure certain data bearing on the production and consumption of beef, questions in which we are all interested, we have made an arrangement with the local butcher which we believe will be of mutual advantage.

Beef from these cattle should prove more satisfactory than the cuts you ordinarily receive. In other words, we believe we have made it possible for you to get a sample of high class beef without extra expense.

We trust, therefore, that we are not asking too much in requesting answers to the questions on the enclosed blank. We shall esteem your answers an especial courtesy.

Very truly yours,
HERBERT W. MUMFORD,
Professor of Animal Husbandry, University of Illinois, Urbana.

Animal Husbandry Department—Form No. 4.

CARCASS NO....

Date of sale..................1902.

Name of cut..................................Weight....................

Is the accompanying cut of beef an improvement in grain, juiciness, tenderness or flavor upon the beef you are ordinarily able to secure? If so, kindly state in what particulars..

....

If it is not, then kindly state in what particulars it fails to be up to the standard of the average quality of beef you are able to buy................

....

Local butchers believe they can not afford to handle beef as well fattened as that from which this cut was taken.

Would you object to having beef containing as high a per cent of fat delivered to you regularly upon your order?

Remarks: ....

....

Name............................

Address..................................

AN EXPERIMENT TO DETERMINE THE BEST METHOD OF PRESERVING AND FEEDING THE CORN CROP.

The initial study of this question has been started as a coöperative experiment on the farm of Mr. E. D. Funk, Shirley, Ill., where some 52 calves have been divided into two lots, one lot getting for a ration shock corn, (corn cut, unhusked and shocked, left standing in the field until fed), oats and clover hay, and the other lot silage, oats, and clover hay. Six acres of corn of the same yield and kind was put into the silo and six acres was cut up and left in shock. It is planned to carry this experiment through this winter, turn the calves to grass in the spring and finish on same rations fall and winter.

AN EXPERIMENT TO ENQUIRE INTO THE ADVISABILITY OF USING SUPPLEMENTARY FEEDS WITH CORN IN FATTENING STEERS.

It was thought best to begin this investigation with gluten meal as that is really a home grown product. At any rate it is a corn product.

An experiment is now in progress at the university where three car loads of steers are being fed as follows: Lot 1, gets shelled corn and clover hay. Lot 2 gets shelled corn, timothy hay and shredded corn stover. Lot 3 gets shelled corn, gluten meal, timothy hay and corn stover. Pigs follow each lot or load of steers and we shall be able to observe whether the gluten meal fed to the steers will benefit the hogs following such steers—an experiment suggested and decided upon.

Professor Mumford has written the experiment station a circular describing in detail the characteristics of the prime steer which is now ready for distribution. It may be had for the asking. (Circular No. 38 enclosed.)

CIRCULAR NO. 38.

UNIVERSITY OF ILLINOIS.

AGRICULTURAL EXPERIMENT STATION.

URBANA, ILL., JANUARY, 1902.

CHARACTERISTICS OF THE PRIME STEER.

The prime steer should present conclusive evidence to sight and touch that he possesses to a high degree the form, condition and quality demanded by the dealer in high class beef.

I. FORM. The butcher demands not so much that parallelogramic form so popularly spoken of by many authorities, as he does a high state of development in loin, crops, back, thighs, twist and rump. He demands development in these regions because they are the parts from which are secured the high priced cuts. The animal should show plenty of depth and breadth furnishing a large surface for flesh, without that tendency to be paunchy which would be objectionable to the butcher. He seeks also, smooth, well rounded, general outlines which indicate both evenness of flesh and an absence of that tendency to be rough and coarse which would mean loss to him, since the waste in the dressing of the rough, coarse beast would be out of proportion with the weight of the marketable beef. Then, too, the butcher is not unmindful of the fact that having secured satisfactory development of these parts from which are taken the high priced cuts, there is an added value in securing thick, even flesh throughout, on the cheaper as well as the more valuable parts of the carcass.

To the untrained eye, an unsual development of loin, crops and thighs would detract from the beauty, style and gracefulness of the beast. To the butcher, such development would increase rather than detract from its value. It should be clearly borne in mind therefore that no beauty of outline, style or gracefulness of carriage will ever take precedence of proper development in most important and valuable parts of the bullock. Nor should we assume that the highest development in these most valuable parts is incompatible with an ideal beef form. It is entirely consistent and desirable that we hold up as our ideal standard of the prime steer a combination of well developed parts from which are taken the high priced cuts, and that uniformly high development in all parts capable of taking on flesh which gives to the animal symmetry and smoothness of outline, that style and that beauty otherwise impossible.

2. QUALITY. (I) General quality and (2) quality of flesh or condition. (I) General quality. General quality in a fat steer is indicated by a medium sized, fine, clean cut, breedy featured head, bearing ears of moderate size

and texture; short legs with clean fine bone; a fine nicely tapering tail; fine hair; a pliable skin of medium thickness, and smooth well rounded outlines. (2) Quality of flesh and condition of animal. The quality of beef depends largely upon the condition of the animal. By condition we refer to the degree of fatness of a bullock. However, it should not be assumed that the highest quality in beef is found in the fattest beast. There are two principal reasons for fattening a steer. (a) So to fill the animal inside and out with fat that when dressed there will not be a high percentage of offal or waste. In other words, a fat animal, other things being equal, will dress a higher percentage than a half fat or a thin one. And further, in the fat animal the proportion of these parts, which from their very nature are unsalable is reduced to the minimum. (b) That the flesh or lean meat shall be rendered more tender, juicy and of better flavor by the disposition of fat throughout its substance.

Undoubtedly, the possibility of securing the highest quality in beef is influenced by the breeding and general quality of the animal.

Methods both of growing and fattening the beast influence the quality of its flesh. There is too, a quality of flesh which is peculiar to the individual and which is indepedent both in breeding and methods of feeding. Desirable quality in flesh is indicated by a firm yet mellow and springy consistency of the flesh at the crops, along and back, at the loins and even on the sides, beneath the gentle presure of the outstreched hand. Good quality of flesh is indicated in the fat steers by the abscence of ties and rolls, or patches of gaudy flabby fat.

A tendency to lay on fat in bunches and to roll at the loin indicates that during the fattening process the fat has been deposited in large masses and has not been evenly distributed throughout the animal giving to the flesh that marbled character so necessary to the highest quality in beef.

Undoubtedly, outstanding coarseness and lack of general quality in the live animal are inseparably linked with undesirable texture in the cut from such a beast. Fullness at the base of tongue, fullness or roll of fat in front of point of shoulder, a full twist, a large mellow cod, a low, full, thick flank that stands out and rolls visibly as the animal walks, fullness and smoothness at rump and tail head indicate that degree of fatness which is essential to the highest quality in beef.

When the ends of the fingers are gently pressed in the flesh on the side of the beast in an effort to find the ribs, there should be a firmness of flesh that does not admit of freely and easily forcing the fingers to the ribs and between them. A lack of firmness indicates the presence of too large a proportion of fat which may be due, either to a too fat or over-done condition of the animal or to an inherent lack of flesh, either of which is decidedly undesirable. A proper degree of firmless shows the presence of plenty of flesh or lean meat.

It is as difficult as it is unecessary to decide whether form, (used in its techinical sense), condition or quality is of greatest importance to the buther. The main point to bear in mind is, that an animal characteristically deficient in any one of the above requirements is disqualified to meet the full demands of the dealer in high class beef and consequenty is not to be considered as a prime steer which would command the highest market price.

It might be well to add that a two year old steer possessing the desired form, condition, and quality, weighing from 1,500 to 1,600 pounds is the one—other things being equal—that will command the highest market price. It is not scale or weight, nor, within certain boundaries, age, but quality and condition that command the top prices in the market.

HERBERT W. MUMFORD,

Professor of Animal Husbandry, University of Illinois, and Chief in Animal Husbandry, Agricultural Experiment Station.

LIVE STOCK INVESTIGATIONS.

FINANCIAL STATEMENT TO FEBRUARY 5, 1902.

FEEDING EXPERIMENTS.	
Purchase of experiment stock	$1,970 00
Feed for experiment stock	1,369 96
Building sheds, feed lots and storage	967 57
Labor, including carpenter work on feeding sheds, etc	500 94
Printing and office fixtures	295 98
Traveling expenses	101 98
Set of farm scales	87 50
Total expenditures for feeding investigations	$5,293 93
Total appropriation for year ending July 1, 1902	8,000 00
Balance February 5, 1902	$2,706 07
SPECIMENS.	
Purchase of dairy stock	$1,000 00
Purchase of specimen cattle, sheep and cattle	1,377 35
Salaries for instructors in stock judgiug and in the most advanced and approved methods of live stock husbandry	658 30
Feed for speciment stock	604 02
Labor in caring for specimen stock	435 55
Printing and office supplies and fixtures	488 00
Traveling expenses	223 05
Freight and express charges on stock loaned of breeders	150 20
Alterations in buildings for specimen stock	113 36
Total expenditures for purchase and maintenance of specimen stock and instruction	$5,049 83
Total appropriation for year ending July 1, 1902	8,000 00
Balance on hand February 5, 1902	$2,930 17

REPORT ON CORN INVESTIGATIONS AND EXPERIMENTS.

Report by F. A. Warner, Sibley, Ill.

CORN BREEDING.

The experiments in breeding corn to improve its chemical composition, which have been carried on in a small way by the Illinois Experiment Station for several years, are being continued on a much larger scale and so extended as to include not only chemical improvement but improvement in physical characteristics, yield, etc., and to include not only the one variety of corn upon which most of the earlier work was done, but also all of the best varieties which are grown in the State; and the experiments are no longer limited to the university farm but are being carried on in coöperation with several of the best corn breeders in different sections of the State.

1. Two varieties of corn, Silver Mine and Riley's Favorite, are being bred with the coöperation of F. A. Warner, Secretary of the Illinois Seed Corn Breeders' Association and manager of the estate of Hiram Sibley, at Sibley, Ford county.

2. Two fields of Reid's Yellow Dent are being bred with Jas. L. Reid, of Delavan, Tazewell county.

3. Two varieties of corn are to be bred with the coöperation of the Funk Bros. Seed company, of Bloomington, McLean county.

4. Two fields of Leaming are being bred, each lot for a different purpose, in coöperation with E. E. Chester, President of the Illinois Corn Growers' Association, Champaign, Champaign county.

5. One field of Leaming is being bred with Jas. O. Toland, of Humbolt, Coles county.

6. One field is to be bred with John R. Clisby, Secretary of the Illinois Corn Growers' Association, of Arcola, Douglas county.

7. One field of Boone County White is being bred in coöperation with A. P. Grout, of Winchester, Scott county.

8. Seven different fields, including three different varieties of corn, are being bred on the university farm at Urbana.

The object of the work in corn breeding is, of conrse, to increase the yield and to improve the quality in different directions. For factory use corn is bred in quite a different way and for a different purpose than for use in stock feeding.

By cooperation with reliable corn breeders in various sections of the State much more extended experiments can be conducted, and a way is thus provided to breed corn in much larger amounts than could be done on the university farm alone, and a way is also opened to subsequently supply the demand which is rapidly increasing for seed corn which is well bred and bred for the purpose which the crop is to serve.

As soon as well bred seed corn can be grown in sufficient quantities by this system of coöperation it can be supplied to other corn growers, and thus the work can be extended until any desired kind of thoroughbred seed corn can be secured by any corn grower in the State.

An exact record of the pedigree of all corn which is being bred is kept at the Illinois Experiment Station.

EXPERIMENTAL FIELDS FOR CORN CULTURE.

So far five experimental fields have been located with the idea of conducting experiments in corn culture under the conditions peculiar to different localities. Care has been taken to pick out fields for this work which are typical of the corn area of the State. The fields are located at Sibley, Bloomington, Jacksonville, Decatur and Urbana. The plan is to use fields about ten acres in size for the continuous experiments and to select such other fields for special experiments as may seem best under the conditions.

The so-called continuous experiments to be begun this year will include—

1. Experiments with corn cultivation.
   - (a) Trials of different cultivators.
   - (b) Effect of different depths of cultivation.
   - (c) Effect of frequent vs. infrequent cultivation.

2. Experiments to determine varieties of corn best adapted to the section of the State in which the corn is grown. This will include a comparative test of the standard varieties of corn with the so-called varieties advertised in seed catalogues, and with other new varieties.

3. Experiments with different amounts of seed per acre, as one stalk per hill, two stalks per hill, three stalks per hill, and four stalks per hill. This experiment will also include the distance of the rows apart in the field, and the distance apart of the hills in the row.

4. Experiments with depth of plowing. The effect of the different depths of plowing on the field per acre. This experiment will also include the preparation of the seed bed to best secure the conditions of germination.

TESTING SHRINKAGE OF EAR CORN IN CRIB.

1. Crib at Sibley, at the Sibley estate in Ford county. Yellow corn.
2. Crib at Urbana, at the Illinois experiment station. White corn.

The plan of the above experiment is to weigh a crib of corn every week, finding in this way the actual loss from shrinkage of the corn in the field. Owing to the moisture in the atmosphere, little difference in weights have been found as yet.

METHODS OF HARVESTING AND PRESERVING CORN.

A silo was built on the farm of Eugene Funk, at Shirley, McLean county. The cost of building and filling silo, together with the weight of corn put into the silo, was accurately kept. This ensilage is now being fed under the direction of the department of animal husbandry, University of Illinois, with the idea of determining the profitableness of ensilage for fattening cattle compared with ordinary shock corn and other feeds.

The plan of this experiment is to find out by careful trial the most economical manner of harvesting corn, under Illinois conditions, for fattening beef cattle and swine.

SPECIAL EXPERIMENTS.

1. Time of Plowing. A comparison of the effects of fall plowing and spring plowing on the preparation of the seed bed for corn and upon the productive capacity of the soil.

2. Listing. A comparison of the practice of the methods of listing in the sections of the State where it is generally practiced, with the usual methods of the preparation of the seed bed.

DISTRIBUTION OF INFORMATION REGARDING CORN.

1. Display at State Fair. An exhibit of breeds of corn, corn products, the composition of corn, and the results of breeding upon the composition of corn was made at the Illinois State Fair and at the International Live Stock Exposition, in 1901.

2. Convention of Corn Growers and Breeders. A two weeks' study in corn judging was held at the Illinois Agricultural College, Jan. 20-31, 1902.

3. Farmers' Institutes. About 75 meetings of farmers were attended by one or more experiment station employés during the past institute season to discuss such subjects as corn judging, corn culture, and corn breeding. These meetings included the meeting of the Indiana Corn Growers' Association and State Board of Agriculture, Indianapolis, Jan. 8, 1902, and that of the Kansas State Board of Agriculture, Jan. 10, 1902.

TESTING VITALITY OF SEED CORN.

A laboratory has been provided at the university for testing the vitality of samples of seed corn by the experiment station.

The utmost care is used in doing the work connected with these corn experiments; an exact account is kept of every kind of work done and tools used; temperatures of the air and soils will be daily kept as soon as spring work opens, exact weather conditions will be recorded, and our next annual report will give some interesting results.

Respectfully submitted,
F. A. WARNER,
Secretary Illinois Seed Corn Breeders' Association.

Compiled at the college of agriculture, University of Illinois, Feb. 14, 1902.

REPORT OF COMMITTEE ON SOIL INVESTIGATIONS AND EXPERIMENTS.

To the Honorable Board of Directors, Illinois Farmers' Institute:

GENTLEMEN—We, your committee appointed in accordance with the provisions of section 3 of bill 315 enacted into law by the Forty-second General Assembly, report progress as follows: (See sections 3, 7 and 8 of bill.)

In accordance with the provisions of this bill your committee met at the agricultural college at Urbana, Ill., June 18, 1901. The proceedings of this meeting were given to you as a report of progress Oct. 3, 1901, a copy of which is herewith attached.

The conference called to consider plans for soil investigation met at the agricultural college, Urbana, Ill., June 18, 1901, at 8:15 a. m.

There were present from the committee appointed by the State Farmers' Institute, Messrs. E. W. Burroughs, Ralph Allen, H. D. Hughes and Walter R. Kimzey, and from the experiment station, Director E. Davenport and Messrs. Hopkins, Ward and Smith. Director Davenport called the meeting to order and discussed briefly the general purpose of the conference. Professor Hopkins was elected as temporary chairman to act when the director was not present, and Mr. Kimzey was elected as secretary.

After consultation and discussion. the following lines of soil investigation were agreed upon:

1. In order to determine the immediate needs of the soil it was agreed that plot experiments should be conducted in about 15 or 20 localities in different sections of the State on different classes of soil which are typical of large areas of land. These plot experiments should include applications of the different elements of plant food and different methods of soil treatment in order to discover whether the soil is deficient in the available supply of any essential elements of fertility, whether its physical condition may be improved, and its productive capacity increased.

2. Analysis should be made of the various typical soils throughout the State, (beginning with those which represent the largest areas), to determine the total quantities of the various elements of plant food in the soils and the conditions in which it exists, both in virgin soil and in the long cropped and worn soils of the same type, in order to ascertain the effects of past and present systems of farming upon the stock of fertility, and to furnish information as to the system of farming which should be adopted for the various types of soil so that fertility may be utilized and conserved.

3. Investigations should be made of various soils of the State which are representative of large areas, and which present special difficulties, as, for example, the "scalds," the so called "dead dog," "bogus" or "alkali" lands, etc.

4. It was agreed that the experiment station should invite the coöperation of the division of soils of the United States Department of Agriculture in beginning a soil survey of the State.

The committee voted to recommend to the trustees of the University of Illinois that they employ some competent person whose duties should include frequent reports to the press of the State regarding the work of the agricultural college and the progress of agricultural experiments and investigations.

Under date of September 20, 1901, Professor Cyril G. Hopkins reported to your committee in regard to progress of the work, as follows:

"I have completed the work of locating experiment fields for soil investigations for this season, and am exceedingly busy in getting the work under way. The plan under which we are working is to select an experiment field where soil shall be typical or representative of a large soil area. We take samples of soil from this field for analysis and also samples from one or two other similar fields in the vicinity which we shall also analyze and compare with the soil from the experiment field. In addition to this we take, whereever possible, a sample of virgin soil from land adjacent to the experiment field. The experiment fields selected are usually old and well-worn soils, so that a comparison of the analysis of the virgin soil with that of the soil from the experiment field is expected to show the effect which has been produced by long years of cropping.

"The experiment field is usually divided into two parts. On one of these we make applications of all of the more important elements of fertility, both separately and in different combinations, and only one kind of crop will be grown upon this field, and even the first year's results, if the season is a normal one, should indicate what element or elements of fertility the soil may be deficient in, or whether it is not deficient in any of them. The other part of the experiment field is set apart for a series of rotation experiments in which a practical rotation is to be adopted, usually a three or four years' rotation; and, in the rotation work, we will also test the effect upon the soil of those important elements of fertility which the farmer must purchase if his soil is deficient in them, as phosphorus and potash, for example. We hope to ascertain whether it is necessary or profitable to purchase any commercial fertilizer where rotation of crops is practiced, and, if so, which of the elements of fertility should be purchased. We also hope to determine in the rotation experiments to what extent nitrogen can be accumulated from the atmosphere and to what extent leguminous crops should be grown in order to maintain a sufficient supply of nitrogen in the soils for the most profitable crop production. The first part of the experimental work, that is, what we term straight fertility work, should yield valuable results the first year; but these straight fertility experiments are designed primarily to furnish information regarding the soil as quickly as possible. They are not to be considered in all cases as the thing to do in ordinary farm practice. For example, we shall purchase the element nitrogen in the form of a commercial fertilizer and apply it to the land in order to determine as quickly as possible whether the soil needs more nitrogen; and, if it does, then the thing for the land owner to do is not to purchase nitrogen in the market just as we have done, but rather to make more liberal use of leguminous crops and thus secure his nitrogen from the free supply of the atmosphere. We purchase it for the experimental work because we can thus put more nitrogen in the soil in a few days than we could accumulate by means of leguminous crops in the course of a year or two; and, while the purchase of nitrogen is not considered practical for profitable crop production, it is practical for the purpose of securing information regarding the needs of the soil as quickly as possible. In the rotation experiments, on the other hand, we hope to discover and to demonstrate just what should be done, and could profitably be done, in the regular line of practical farm work; but, as you will readily understand, it will require several years before any conclusive results can be secured from rotation experiments. Thus, if we grow a leguminous crop next year, it will require at least one more year before the effect of the leguminous crop upon the successive crops can be determined.

"Another line of experiments which we are following, especially with abnormal soils, is to collect the soils in sufficient quantity so that we can conduct pot experiments here at the university in our glass-house to determine the effect upon the soils of various kinds of treatment. In this, we are working more particularly upon soils which are reported to contain some injurious substances, and we hope to determine if this is really true; and, if so, if it can be removed or if its injurious effect can be corrected by any practical treatment.

"We are now working in 15 different places in the State, including the one at Urbana, and we are not planning to locate any more fields this year.

"The first year's work, in which it is necessary to get this work started, lay out the fields, stake off the plots and purchase some materials, including some implements to be used in the application of fertilizers, necessarily renders the experiments more expensive than they will be the second year; and it seems not improbable that we can expand somewhat further next year. At any rate it will be much more satisfactory to us and to the man with whom we are coöperating and to many other representative men over the State who are interested in this matter, to have the work expand, or at least that we should continue all of the work that we are now starting, rather than that we should begin more experiments now than we shall be able to keep up.

"In selecting the experiment fields and in collecting soils for analysis, we have endeavored to follow closely the general plan agreed upon by the committee from the State Farmers' Institute, and at the outset we are beginning experiments only upon soils which are representative of the largest and most important soil areas of the State, and we are not attempting to investigate local differences or peculiar soils of very limited areas, although it is recognized that there is need for investigating such soil, and it is hoped that in the future years the work may be extended and expanded to cover many types of soils which we are not now able to work upon.

"As representative of the wheat lands of the south-west part of the State, we have located two experiment fields, one with Mr. W. E. Braden of Cutler, between Randolph and Perry counties, on the higher and lighter type of wheat soil, and one with Mr. John A. Rumer, on the farm of Mr. Geo. Postel, of Mascoutah, in St. Clair county, on somewhat heavier and lower land.

"As representative of the hill soil in the extreme southern end of the State, probably the commonest type of cultivated soil in the half dozen counties south of the Ozark spurs, we have one field located near Vienna, in Johnson county, with Mr. J. M. Price.

"As representative of the peculiar white soil of Washington, Marion, Clay, and a dozen other counties in that section of the State we have located three experiment fields, one with Mr. A. A. Hinkley, of DuBois, in Washington county, one with Col. N. B. Morrison, of Odin, in Marion county, and one with Mr. Samuel Bartley, of Edgewood, in Effingham county. The Odin field belongs to the type of rather low, flat, prairie land, while the other two fields are somewhat higher and slightly rolling prairie.

"As representative of the black prairie soil of the corn belt, comprising probably 25 counties through the central and north central part of the State, we have located four experiment fields, besides the one at Urbana; namely, with Mr. F. A. Warner, of Sibley, in Ford county, with Mr. S. Noble King, of Bloomington, in McLean county, both of which are on somewhat high and rolling prairie land, with Mr. John Zeter, of Lincoln, in Logan county, and with Mr. Geo. Conover, of Virginia, in Cass county, both on the heavier and low prairie land.

"As representative of the extensive sandy soils in the north-west central part of the State, we have located an experiment field with Mr. J. C. Drake, of Green Valley, in Tazewell county.

"As representative of the extensive swamp lands in the northern part of the State, we have located two experiment fields, one with Mr. J. H. Milligan, of Tampico, in Whiteside county, and one with Mr. C. C. Porter, of Momence, in Kankakee county.

"As representative of the hill soil in the extreme northern part of the State, we have located one experiment field with Mr. D. M. White, of Antioch, in Lake county.

"If there are any other special points as to the plans for soil work, regarding which you would like further information, I shall be glad to furnish it.

Very truly yours,
CYRIL G. HOPKINS."

The general plan of these soil experiment fields is well illustrated by the plat of the Sibley station and consists of four one-acre plots staked off so that each acre is divided into ten equal parts of 16 square rods each, being in form two rods wide by eight rods long. Each ten-acre is separated from its neighbor by a strip of land one-half rod wide. This arrangement is made so that each plot will be wholly separated and independent and also for the purpose that any fertilizer distributed or other treatment applied to one plot will not effect the growth of plants on an adjoining plot. These intervening spaces also serve the purpose of turning spaces for teams during cultivation. By this arrangement of plots the amount of land needed to secure four acres of experimental ground is a piece of land 42 rods long by 28½ rods wide or about seven and one-third acres. The plots of each acre are numbered in the same manner, those of each acre beginning with 101, 201, 301 and 401, and are known by their serial numbers. Series 200, 300 and 400 constitute a three-year rotation of corn, oats, and some leguminous crop. By using three acres, each crop will be grown each year, that is, each year there will be an acre of corn, an acre of oats, and an acre of legumes growing.

Besides using a leguminous crop in the rotation, it is also the intention to use a leguminous crop as a green fertilizer; for example, on plots 202, 204, 206, 208, either cow peas or sago beans will be sown in the corn when it is cultivated the last time in 1902, and in the corresponding series 302, 304, 306, 308, either clover will be sown with the oats or some other leguminous crop will be sown immediately after the oats are harvested. In order to make a comparison and, if possible, determine the relative value of manure as compared with leguminous catch or cover crop, manure will be used on plots 203, 205, 207, 209, and the corresponding plots in 300 and 400 series. Besides this, in each series in the three-year rotation there will be the comparison in plots 202 and 203 of legume against manure without other fertilizers, then in plots 204 and 205, there will be the comparison of legumes and lime against manure and lime. In 206 and 207 the legumes, lime and phosphorus will be compared with manure, lime and phosphorus. In 208 and 209 legumes, lime and potassium will be compared with manure, lime and potassium. Plots 201 and 210 are check plots, 201 having no fertilizer whatever and 210 having all three mineral fertilizers applied but without either manure or a leguminous catch crop.

The object of this three-years rotation of crops in three series of plots is to determine as far as possible how much of the nitrogen of the air may be brought to the soil as plant food by the use of leguminous plants both in a regular rotation of crops and also by the use of leguminous plants as a catch crop sown when laying by corn and with or after oats, and also to determine if the waste of plant food in the soil by cultivation and cropping may be retarded or perhaps wholly checked by a systematic rotation of crops.

The series of plots in the acre numbered 100 represents what is termed the straight fertility test, or experiment in which a complete test of all the important elements of fertility in the soil is made; in other words, this test is designed to determine if any element of plant food is deficient in the soil. This will be accomplished by adding the different elements of fertility singly and in combination to the several plots, the effect of which will be shown in the growth of the crop to which this acre is planted. For instance, if potassium is deficient in the soil, those plots to which potassium is added should produce an increased growth over those plots to which this element had not been supplied. The first year of the experiment should indicate what elements of plant food, if any, are deficient in the soil; though the experiment should be continued with the same crop for two or three years in order to determine what effect the application of these different elements of fertility will have upon the soil.

The manner of cropping this series of plots may not be such as would be advisable for a farmer in a business way to follow, for the object in this experiment is to find out as quickly as possible what may be needed in the soil and how this need can most economically be supplied. Thus in the case of nitrogen, though it is the most costly element in a commercial way, it is nevertheless procured for this experiment by purchase and applied to the soil instead of securing it in the much more economical, though very much longer method of taking it from the atmosphere by means of leguminous plants.

The fertilizers used in these experiments are such as will most quickly furnish the element of plant food desired. Nitrogen is supplied in the form of dried blood procured from the Chicago slaughter houses, and which contains about 12½ per cent of nitrogen. Phosphorus is supplied in the form of bone meal procured from the Chicago slaughter houses. It contains about 12½ per cent of phosphorus. Potassium is supplied in the form of crude potassium chlorid, an important product, which contains about 41 per cent of potassium. The lime used is the common air-slacked lime. This is secured at Marble Head, Illinois. In this connection it may be well to notice that three of these commercial fertilizers are Illinois products, and that two of them, bone meal and dried blood, are originally a farm product.

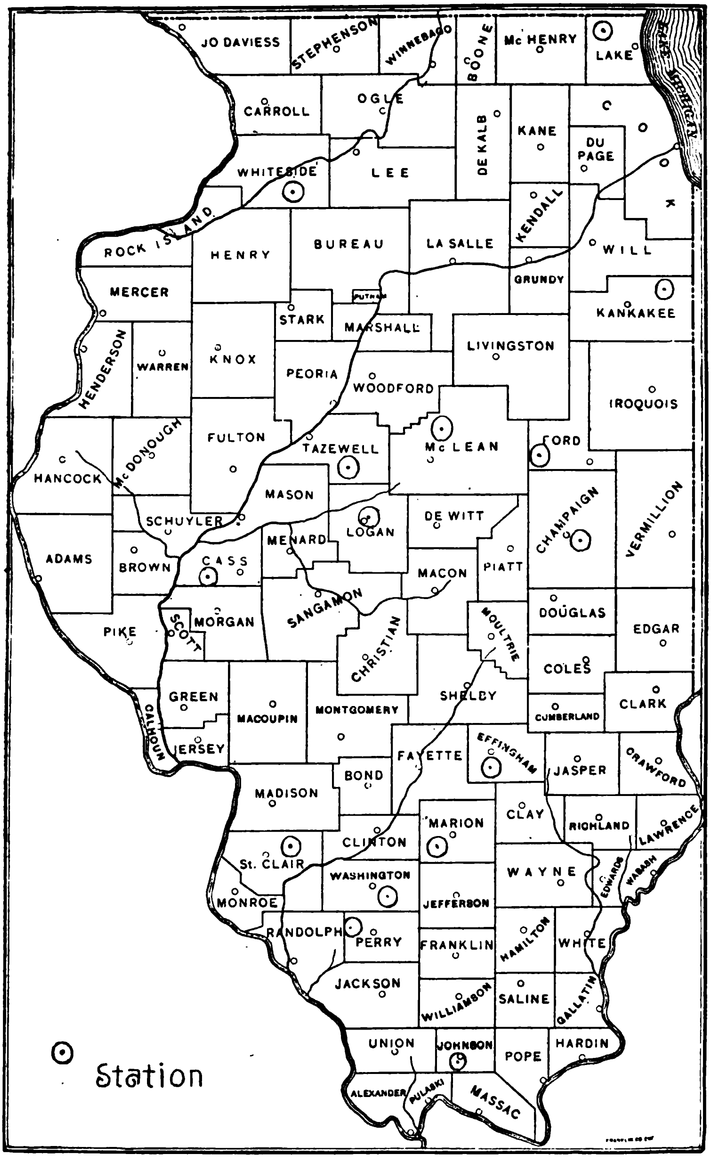
In these experiments these fertilizers are applied in the following amounts per acre:

Potassium chlorid, 41 per cent potassium, 160 pounds.
Bone meal, 12½ per cent phosphorus, 320 pounds.
Dried blood, 12½ per cent nitrogen, 800 pounds.
Lime (see below), 400 to 2,000 pounds.

In regard to lime, it should be understood that its use is not for the purpose of supplying an element of plant food, as most soils contain sufficient lime for the very limited needs of the plant; the object of its use is to destroy or neutralize a possible acid condition of the soil, and the amount of lime applied will vary with the acidity, or sourness, of the soil. Many soils of Illinois have been found to be acid, or sour, and as long as this condition exists, agricultural plants can not grow well in them, even though they contain a sufficient amount of the elements of plant food; and as long as a soil is acid, the addition of needed elements of fertility would not be effective in producing an increase in plant growth.

It will be noticed that the intervening spaces between the tenth-acre plots and also the two-rod wide borders which separate and surround the group of acres take up considerable land, these spaces on a full sized four-acre station requiring about three and one-third acres. A border strip one-fourth rod wide surrounding every tenth-acre plot (that is, the half-rod division strips between the tenth-acres and a one-fourth border around the whole acre) will be planted with the same crop as is grown on the tenth-acres as a protecting border row or strip. There still remain, as turning rows, division strips one and one-half rods wide between the cultivated acres and an uncultivated border one and three-fourths rods wide surrounding the whole field, which amount to about two acres. It is proposed to sow all these spaces at all the experiment fields to alfalfa, the study of the growth of which it is hoped will lead to valuable results, particularly in regard to the adaptability of Illinois soils to the growth of alfalfa. Investigations will also be made regarding the nitrogen gathering bacteria of the alfalfa plant and their distribution in the soil of the different sections of the State.

At nearly all the experiment fields the ground was plowed last fall, and also surveyed and staked according to the plats, and the different fertilizers were then applied. The fertilizers were applied by means of grain drills having fertilizer sowing attachments. These drills were purchased for the purpose by the experiment station. Owing to the inability of any drill to sow any fertilizer with absolute accuracy, the amounts of fertilizer were actually slightly different than the quantities stated above; however, the exact amount of each fertilizer sowed was always recorded. These fertilizers are preferably sowed in the fall so as to allow time for their decomposition, distribution through, and action upon, the soil, especially in the case of the lime and bone meal.

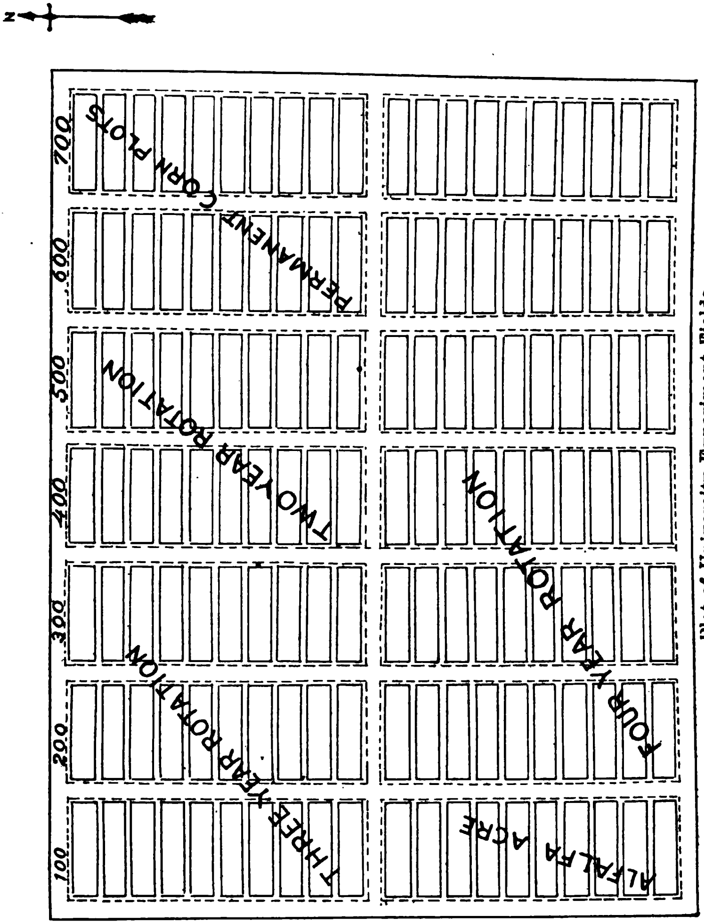


The map is designed to show the location of the soil experiment fields which have thus far been established, and following is a brief classification of these fields including their location, type of soil and plan of investigation.

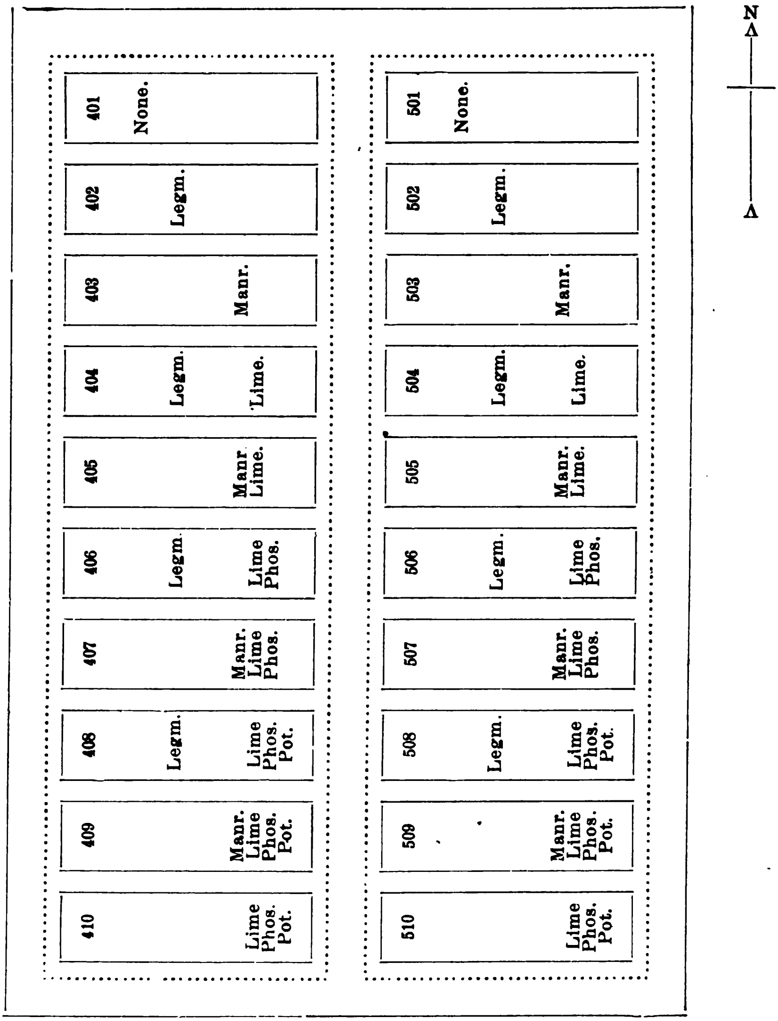
URBANA.

This station is located on the university grounds, south and east of the agricultural building. It is made up of fourteen one-acre divisions (one hundred forty tenth-acre plots) used for the following purposes: Two acres of straight fertility tests; two acres for a two-year rotation of corn and oats, using cow peas as a catch crop; three acres for a three-year rotation of corn, oats, and clover; four acres for a four-year rotation of corn, oats, and soy beans, and with soy beans used as a catch crop. One acre is devoted to alfalfa with applications of different fertilizers and with experiments in inoculation with nitrogen gathering bacteria. The other two acres may be used for miscellaneous soil experiments. The intervening spaces at this station are set with blue grass.

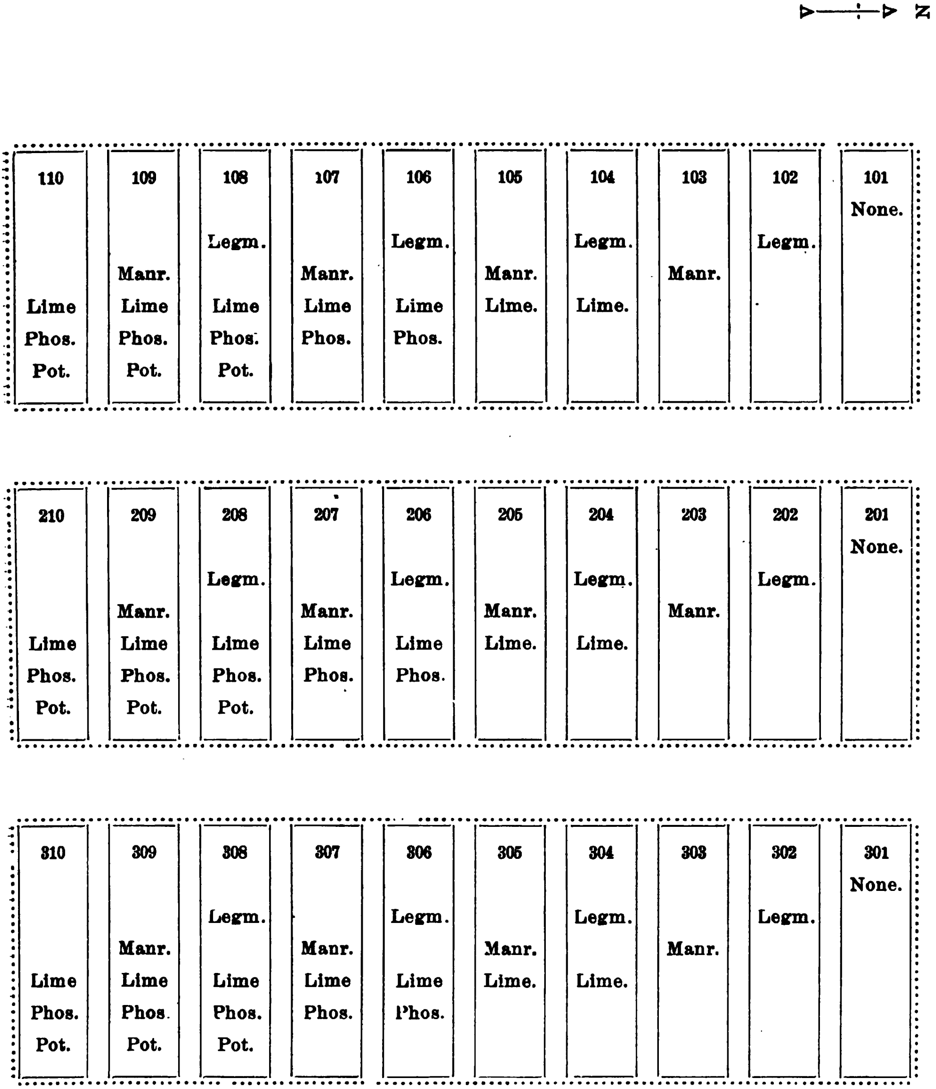
Owing to the close proximity to the College of Agriculture and the experiment station laboratories, it is possible at this station to conduct experiments much more extensively and also along lines requiring much closer attention than would be possible at more distantly located fields. There have been 420 samples of soil taken from these grounds, which will be carefully preserved for the purpose of possible analysis and also for comparison in future years in order to learn the changes which will be likely to occur in the soil by the different methods of fertilizing to which the different plots will be subjected.



Plot of University Experiment Fields.

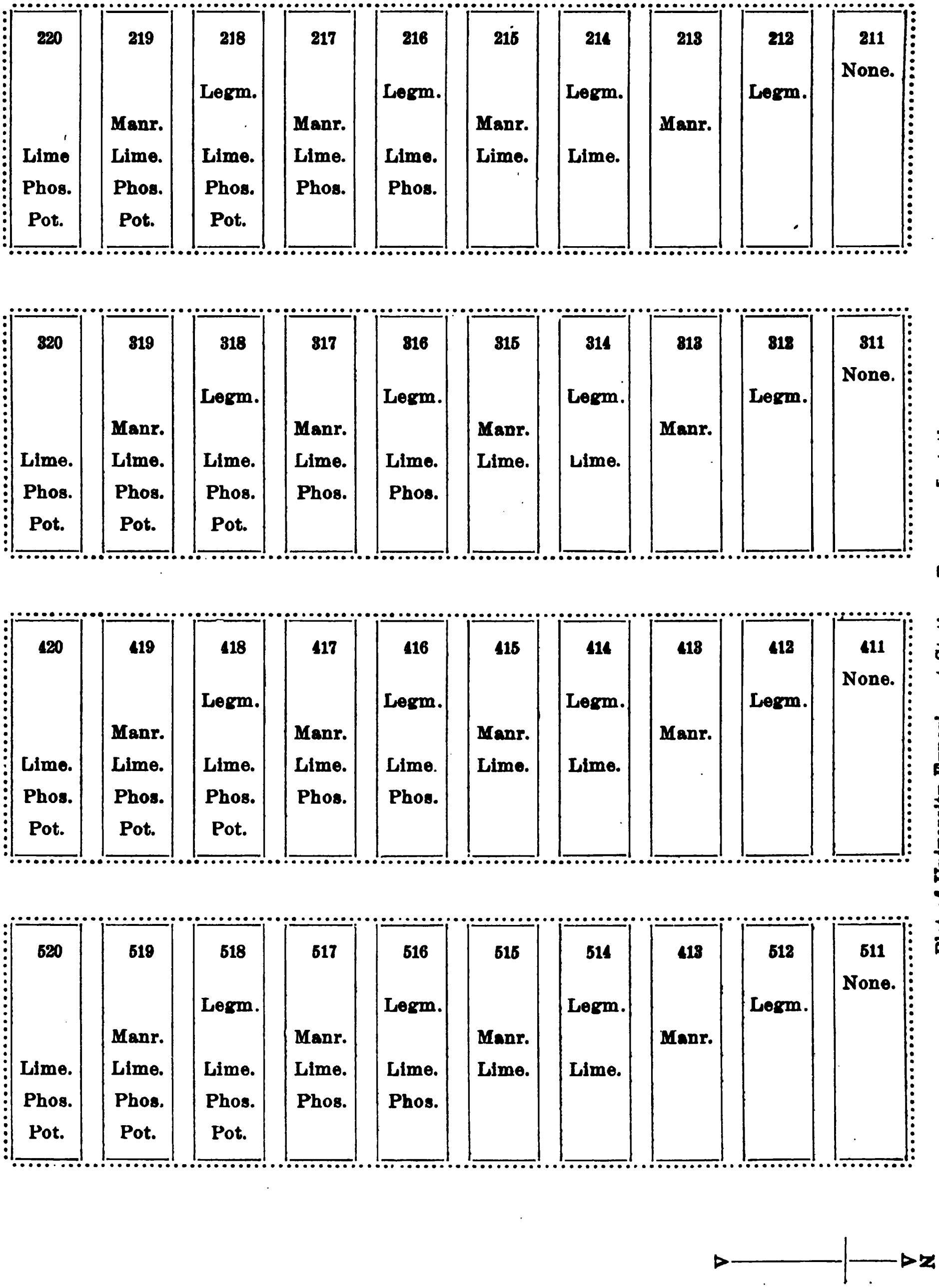


Plot of University Experiment Field—Two-year Rotation.



110 Lime Phos. Pot.	109 Manr. Lime Phos. Pot.	108 Legm. Lime Phos. Pot.	107 Manr. Lime Phos.	106 Legm. Lime Phos.	105 Manr. Lime.	104 Legm. Lime.	103 Manr.	102 Legm.	101 None.
210 Lime Phos. Pot.	209 Manr. Lime Phos. Pot.	208 Legm. Lime Phos. Pot.	207 Manr. Lime Phos.	206 Legm. Lime Phos.	205 Manr. Lime.	204 Legm. Lime.	203 Manr.	202 Legm.	201 None.
310 Lime Phos. Pot.	309 Manr. Lime Phos. Pot.	308 Legm. Lime Phos. Pot.	307 Manr. Lime Phos.	306 Legm. Lime Phos.	305 Manr. Lime.	304 Legm. Lime.	303 Manr.	302 Legm.	301 None.

Plot of University experiment Field—Three-year rotation.



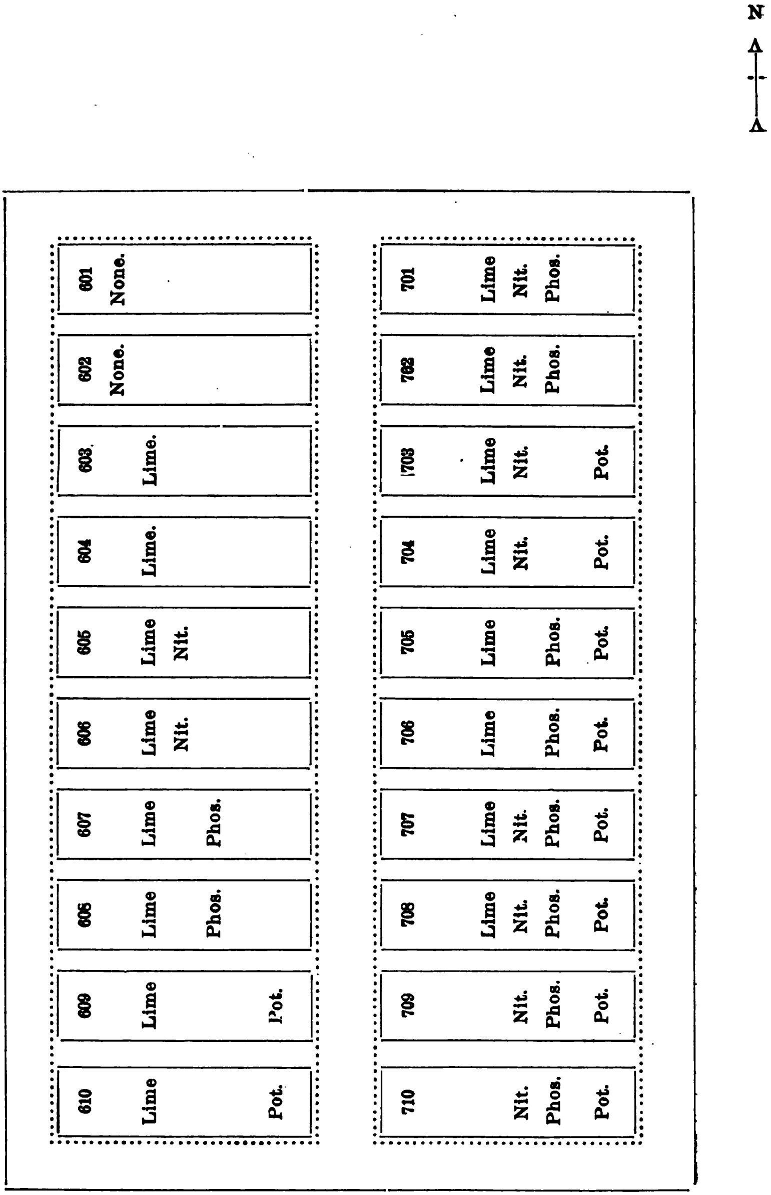
220	219	218	217	216	215	214	213	212	211
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

320	319	318	317	316	315	314	313	312	311
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

420	419	418	417	416	415	414	413	412	411
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

520	519	518	517	516	515	514	413	512	511
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

Plot of University Experiment Station—Four year rotation.

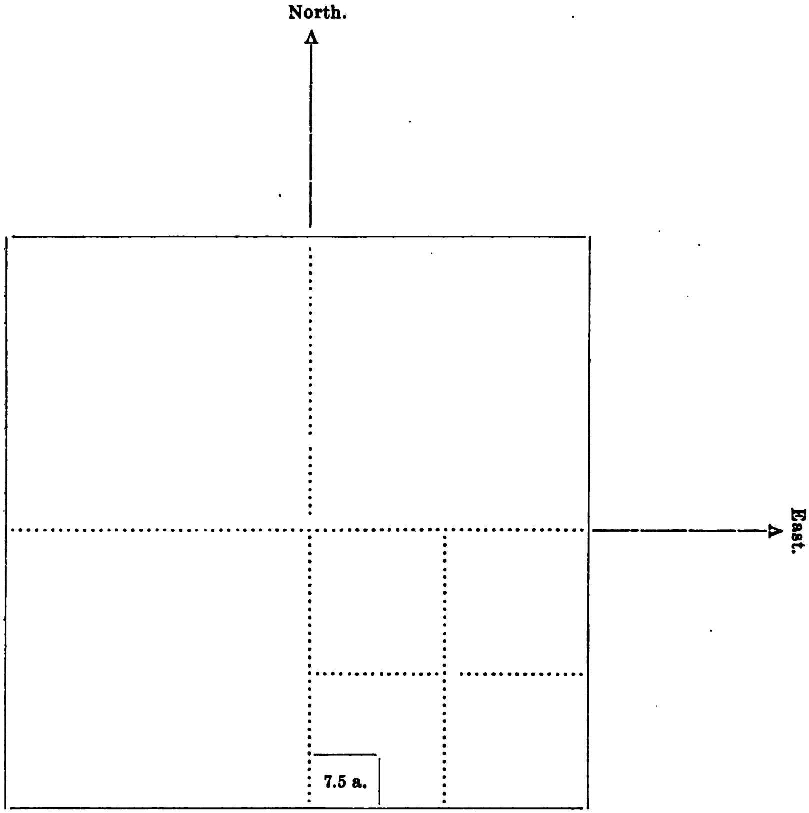


Plot of University Experiment Field—Permanent Corn Plots.

SIBLEY.

This field is located near Sibley, Ford county, on the Sibley estate, manage by F. A. Warner, on farm No. 60, on the W. ½ of S. W. 40 of S. E. ¼ of Sec. 35, Twp. 25 N. R., 7 E. of 3rd P. M:

The plan of the experiments to be conducted at this field will be to devote series 200, 300 and 400 to the three-year rotation experiments, and series 100 to be devoted to the straight fertility tests, as explained in preceding pages. The field occupies seven and one-third acres of a fairly uniform field of old black prairie loam with a yellow clay subsoil, and represents the worn soils of of this region.



S. W. 10 of S. W. 40 of S. E. ¼ of Sec. 35, Twp. 25, N. R., 7 E. 3d P. M. (Farm No. 60.) The Hiram Sibley estate, (F. A. Warner, manager) Sibley, Ford county, Ill.

N

Plot of Sibley Experiment Field.

110	109	108	107	106	105	104	103	102	101
									None.
	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	
Nit.	Nit.		Nit.	Nit.			Nit.		
Phos.	Phos.	Phos.		Phos.		Phos.			
Pot.	Pot.	Pot.	Pot.		Pot.				

210	209	208	207	206	205	204	203	202	201
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

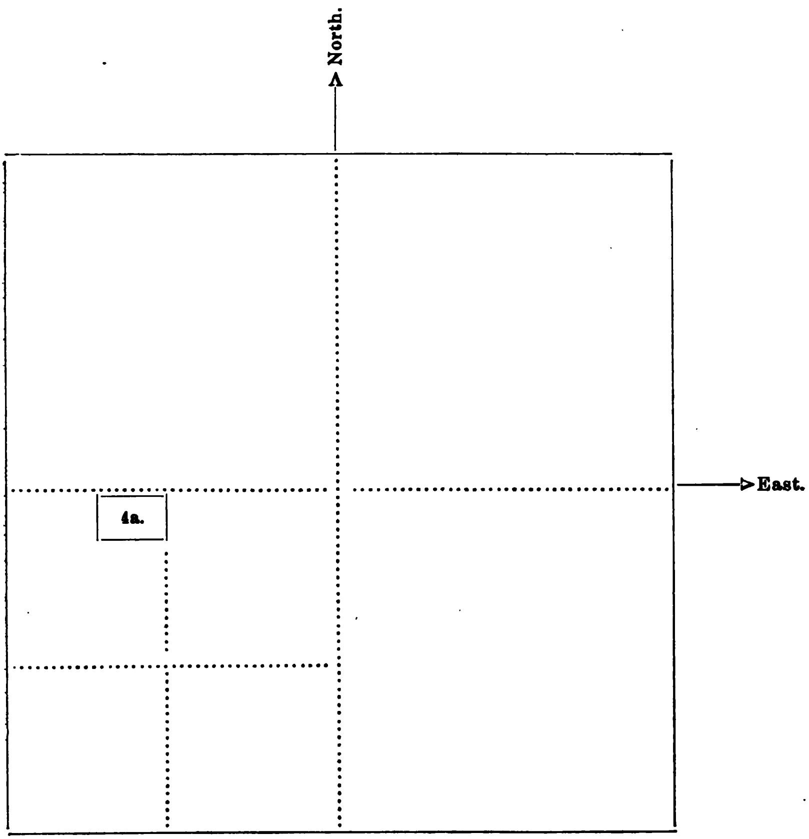
310	309	308	307	306	305	304	303	302	301
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

410	409	408	407	406	405	404	403	402	401
									None.
		Legm.		Legm.		Legm.		Legm.	
	Manr.		Manr.		Manr.		Manr.		
Lime.	Lime.	Lime.	Lime.	Lime.	Lime.	Lime.			
Phos.	Phos.	Phos.	Phos.	Phos.					
Pot.	Pot.	Pot.							

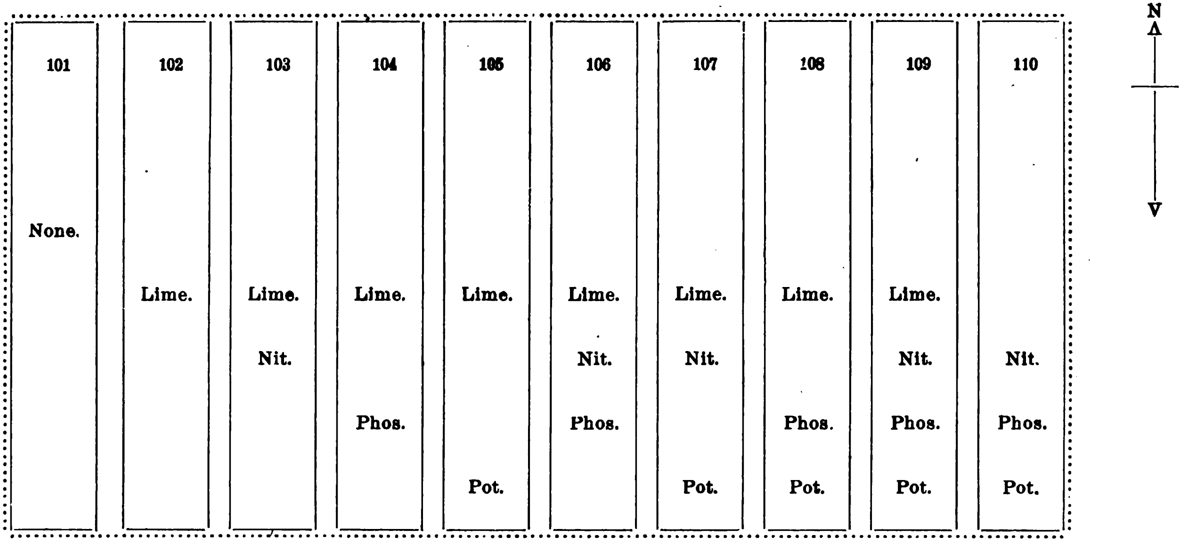
BLOOMINGTON.

This experiment field is located near Bloomington, McLean county, on the farm of S. Noble King, and is on the N. E. 10 of the N. W. 40 of S. W. ¼ of Sec. 25, Twp. 27 N., R. 1 E. of 3d P. M.

At this experiment field two plots of two acres each are used for the straight fertility tests. The field is quite uniform in appearance; it has been well cared for, being in grass or clover much of the past few years, and would produce 60 or 70 bushels of corn on an average year. The soil is the black prairie type of the Illinois corn belt. A two year rotation of corn and oats will be grown at this field.



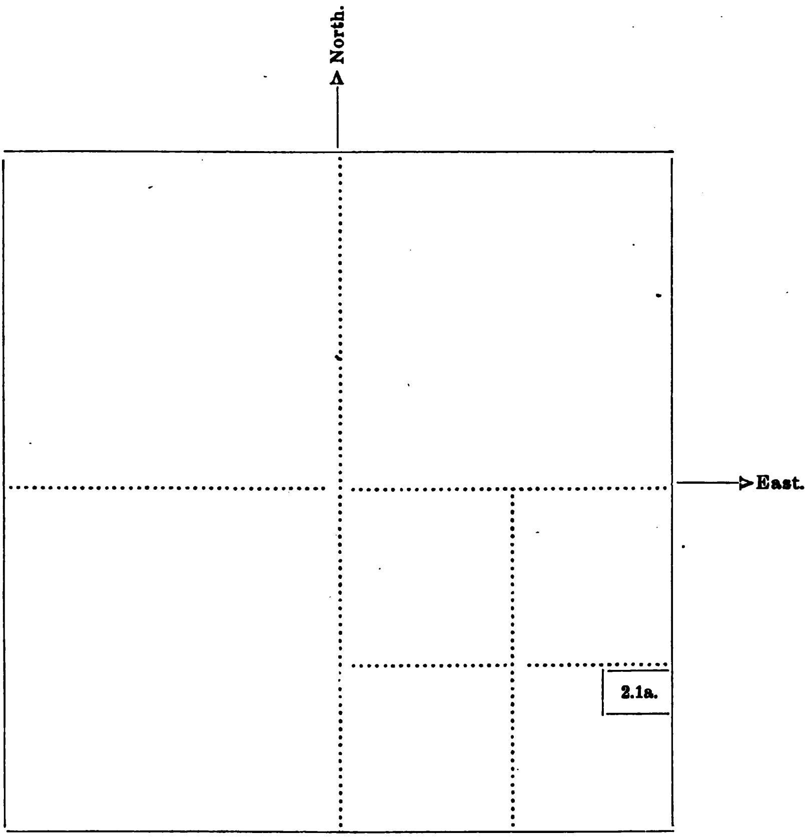
N. E. 10 of N. W. 40 of S. W. ¼ of Sec. 25, Twp. 24 N., R. 1 E. 3d P. M. S. Noble King, Bloomington, McLean county, Illinois.



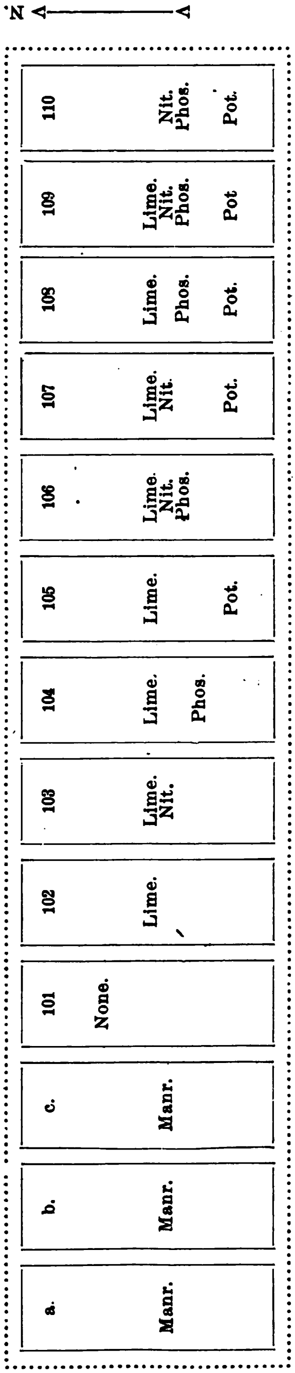
Plot of Bloomington Experiment Field.

LINCOLN.

This experiment field is located near Lincoln, Logan county, on the farm of John Zeter. It is composed of one acre for straight fertility, the same as outlined in the general plan; besides this, there are also three additional tenth-acre plots which will be treated with stable manure, the first tenth receiving at the rate of eight loads of manure per acre, the second tenth at the rate of 16 loads, and the third tenth at the rate of 24 loads per acre. At this field the crop grown will be sugar beets. The soil is typical of the best black Illinois prairie land. It has been cropped continuously for about 40 years, and represents a large area of soil in this region.



N. E. 10 of S. E. 40 of S. E. ¼ of Sec. 33, Twp. 20 N., R., 2 W. 3d P. M. John Zeter, Lincoln Logan county, Illinois.

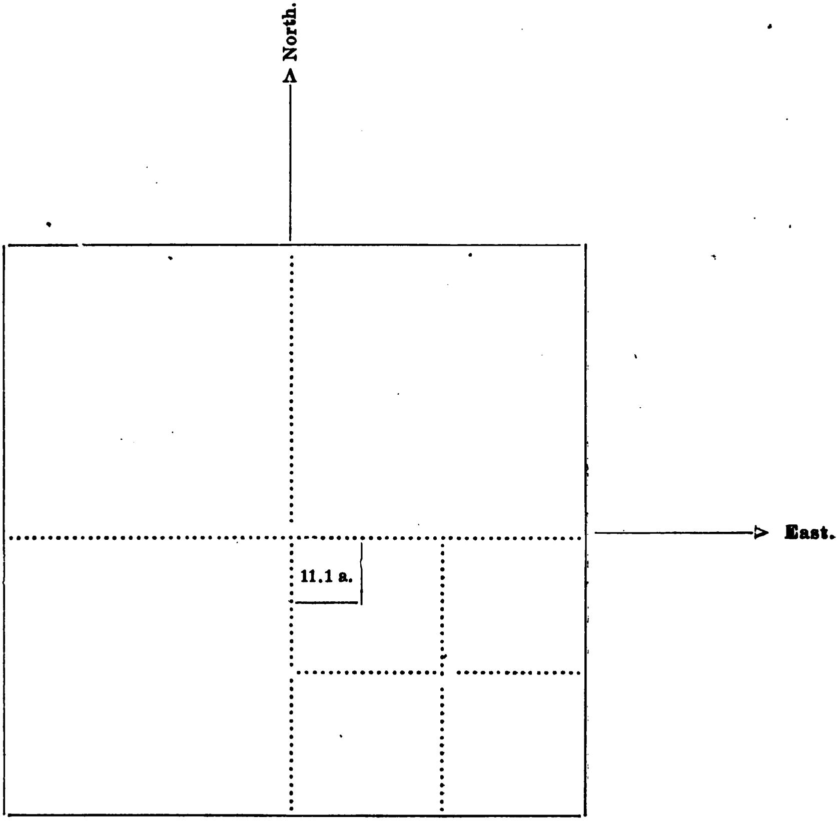


Plot of Lincoln Experiment Field.

VIRGINIA.

This experiment field is located near Virginia, Cass county, on the farm of George Conover, and is situated on the N. W. 10 of N. W. 40 of S. E. ¼ of Sec. 14, Twp. 17, R. 10.

This field has three acres devoted to rotation experiments and one acre devoted to the straight fertility tests, conducted the same as outlined in the general plan. The soil is the old black prairie type and is in good condition, capable of yielding 60 or 70 bushels of corn per acre.



N. W. 10 of N. W. 40 of S. E. ¼ of Sec. 14, Twp. 17 N., R. 10 W., 3rd P. M. George Conover. Virginia, Cass county, Ill.

North.

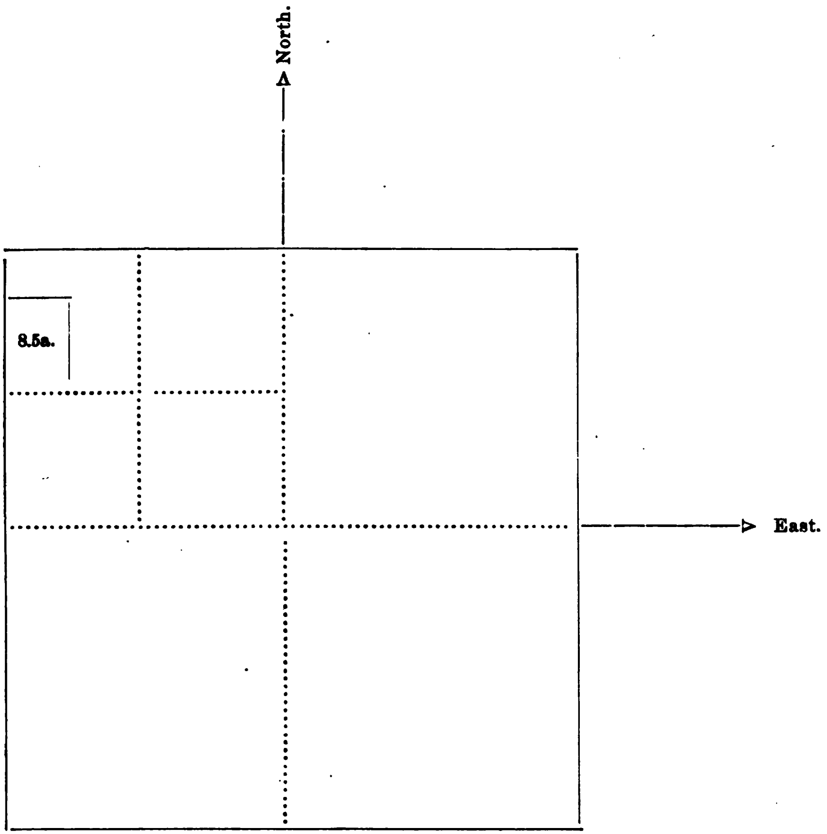
101 None.	102 Legm.	103 Manr.	104 Legm. Lime.	105 Manr. Lime.	106 Legm. Lime. Phos.	107 Manr. Lime. Phos.	108 Legm. Lime. Phos. Pot.	109 Manr. Lime. Phos. Pot.	110 Lime. Phos. Pot.
201 None.	202 Legm.	203 Manr.	204 Legm. Lime.	205 Manr. Lime.	206 Legm. Lime. Phos.	207 Manr. Lime. Phos.	208 Legm. Lime. Phos. Pot.	209 Manr. Lime. Phos. Pot.	210 Lime. Phos. Pot.
301 None.	302 Legm.	303 Manr.	304 Legm. Lime.	305 Manr. Lime.	306 Legm. Lime. Phos.	307 Manr. Lime. Phos.	308 Legm. Lime. Phos. Pot.	309 Manr. Lime. Phos. Pot.	310 Lime. Phos. Pot.
401 None.	402 Lime.	403 Lime. Nit.	404 Lime. Phos.	405 Lime. Pot.	406 Lime. Nit. Phos.	407 Lime. Nit. Pot.	408 Lime. Phos. Pot.	409 Lime. Nit. Phos. Pot.	410 Nit. Phos. Pot.

Plot of Virginia Experiment Field.

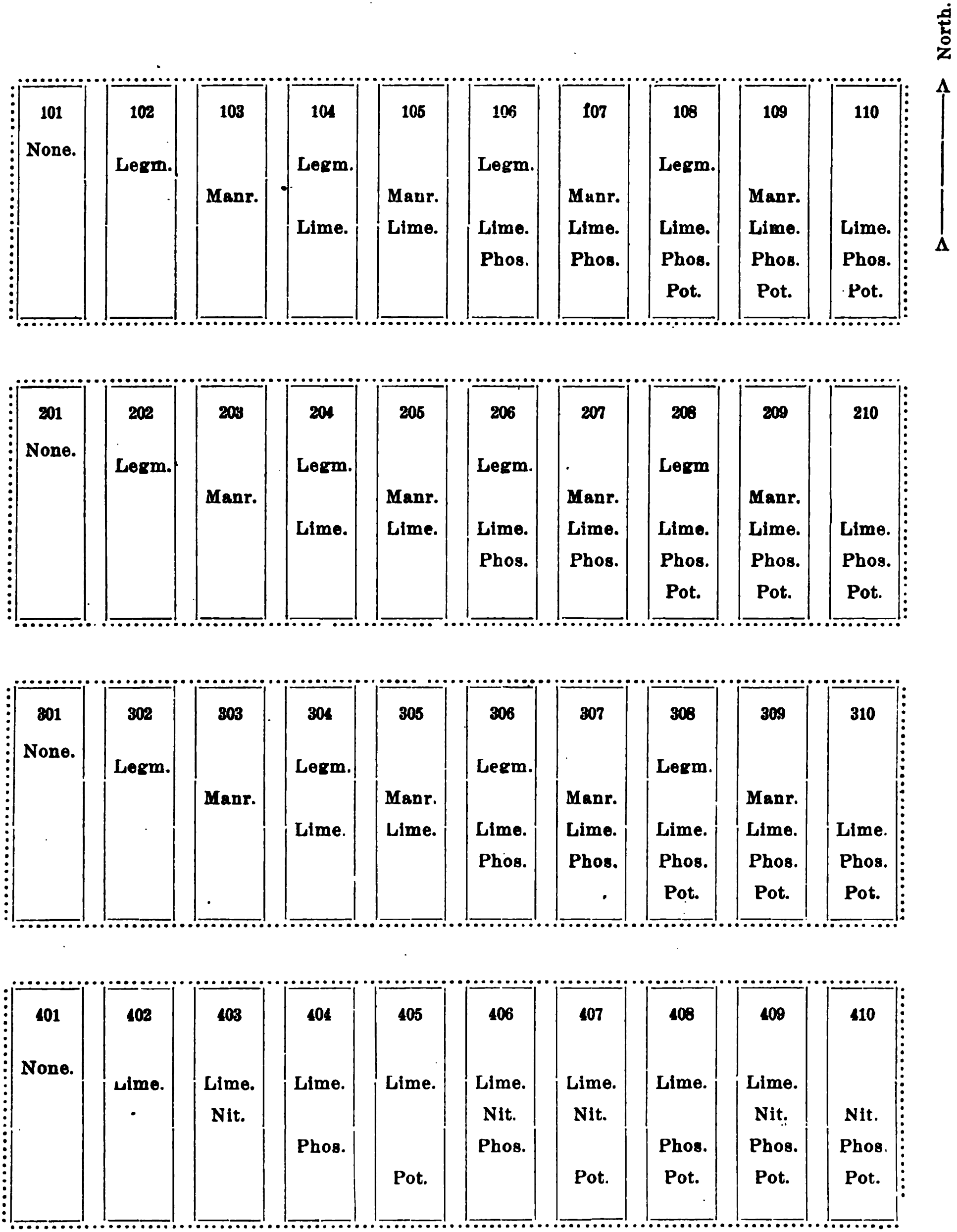
GREEN VALLEY.

This experiment field is located near Green Valley, Tazewell county, on the farm of J. C. Drake, and is situated on the S. W. 10 of N. W. 40 of N. W. ¼ of Sec. 3, Twp. 22, R. 5 W.

This field is composed of three acres devoted to rotation experiments and one acre devoted to the straight fertility tests. This field is located among the sand hills, the higher parts of which are very poor and drift about, while the lower land is quite fertile. The soil of the field represents the better class of soil and was once capable of producing 60 or 70 bushels of corn per acre, but it has yielded poor crops of late years. The soil is sandy but quite dark colored down to about 30 inches, then lighter colored to about 40 inches, and below that it is a light colored, clean sand. The field has been cultivated about 50 years.



S. W. 10 of N. W. 40 of N. W. ¼ of Sec. 3, Twp. 22 N., R. 5 W, 3d P. M. J. C. Drake, Green Valley, Tazewell county, Illinois.



101	102	103	104	105	106	107	108	109	110
None.	Legm.	Manr.	Legm. Lime.	Manr. Lime.	Legm. Lime. Phos.	Manr. Lime. Phos.	Legm. Lime. Phos. Pot.	Manr. Lime. Phos. Pot.	Lime. Phos. Pot.

201	202	203	204	205	206	207	208	209	210
None.	Legm.	Manr.	Legm. Lime.	Manr. Lime.	Legm. Lime. Phos.	Manr. Lime. Phos.	Legm Lime. Phos. Pot.	Manr. Lime. Phos. Pot.	Lime. Phos. Pot.

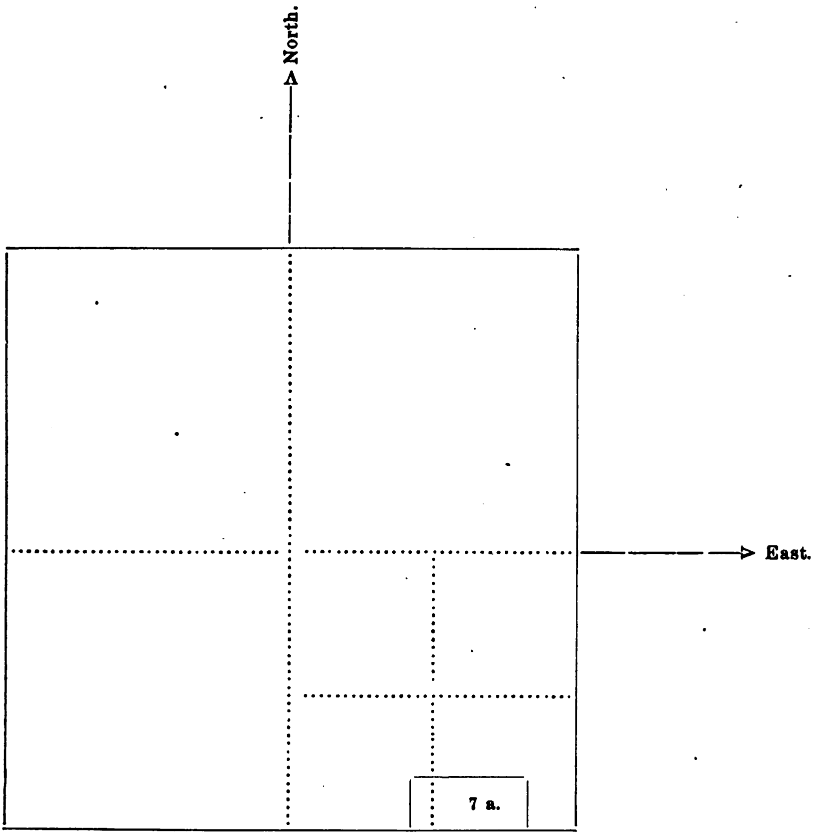
301	302	303	304	305	306	307	308	309	310
None.	Legm.	Manr.	Legm. Lime.	Manr. Lime.	Legm. Lime. Phos.	Manr. Lime. Phos.	Legm. Lime. Phos. Pot.	Manr. Lime. Phos. Pot.	Lime. Phos. Pot.

401	402	403	404	405	406	407	408	409	410
None.	Lime.	Lime. Nit.	Lime. Phos.	Lime. Pot.	Lime. Nit. Phos.	Lime. Nit. Pot.	Lime. Phos. Pot.	Lime. Nit. Phos. Pot.	Nit. Phos. Pot.

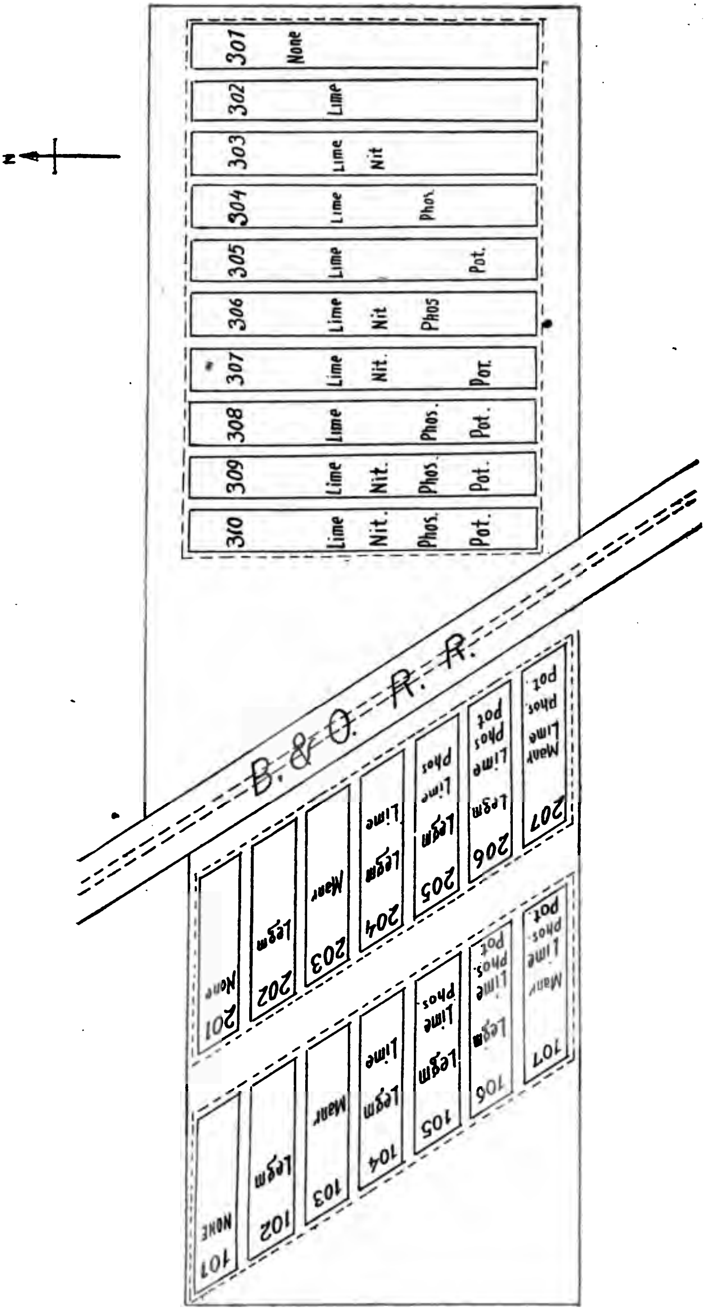
Plot of Green Valley Experiment Field.

EDGEWOOD.

This experiment field is located near Edgewood, Effingham county, on the S. E. 40 of S. E. ¼ of Sec. 30, Twp. 6, R. 5 E., being on the farm of Samuel Bartley. It comprises four acres for fertility tests and rotation. The ground on which this field is located has been cultivated about 40 years. That lying east of the railroad is low and wet, but it has been tile drained, by which the physical condition has been greatly improved. The soil is the white prairie loam of this part of the State, and this low field is the typical crawfish prairie land. The field west of the railroad is representative of the higher prairie land. One-half of this field has been tile drained.

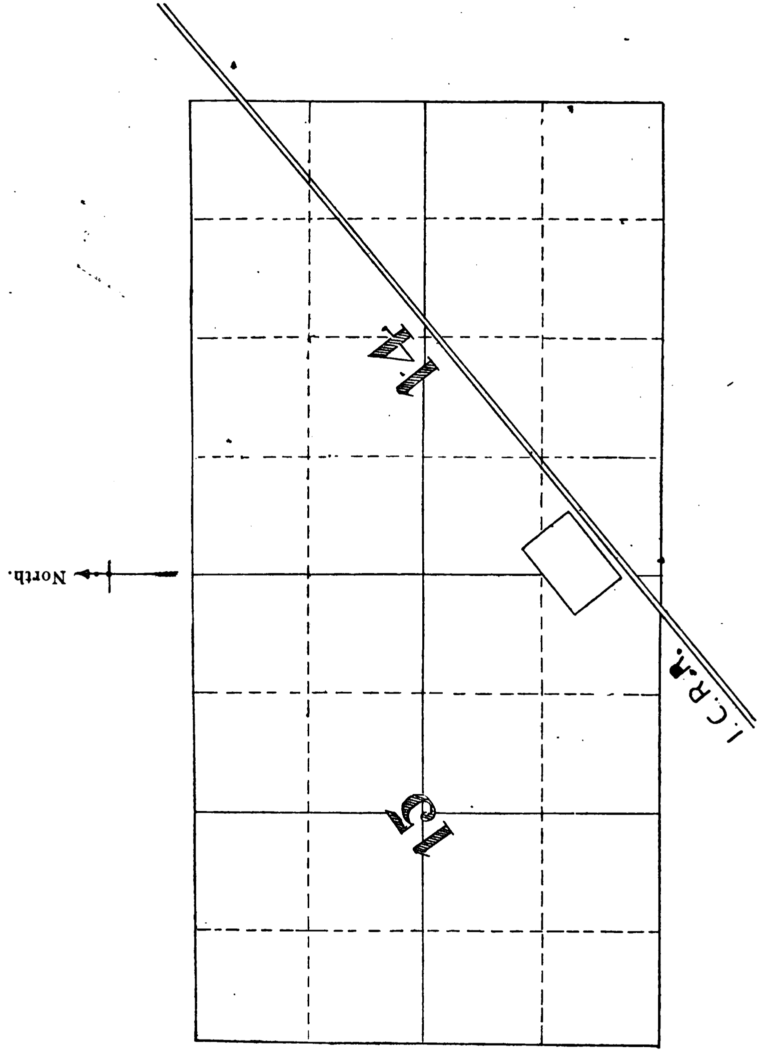


In the S. ½ of S. E. 40 of S. E. ¼ of Sec. 30, Twp. 6 N., R. 5 E. 3d P. M. Sam'l Bartley, Edgewood, Effingham county, Illinois.

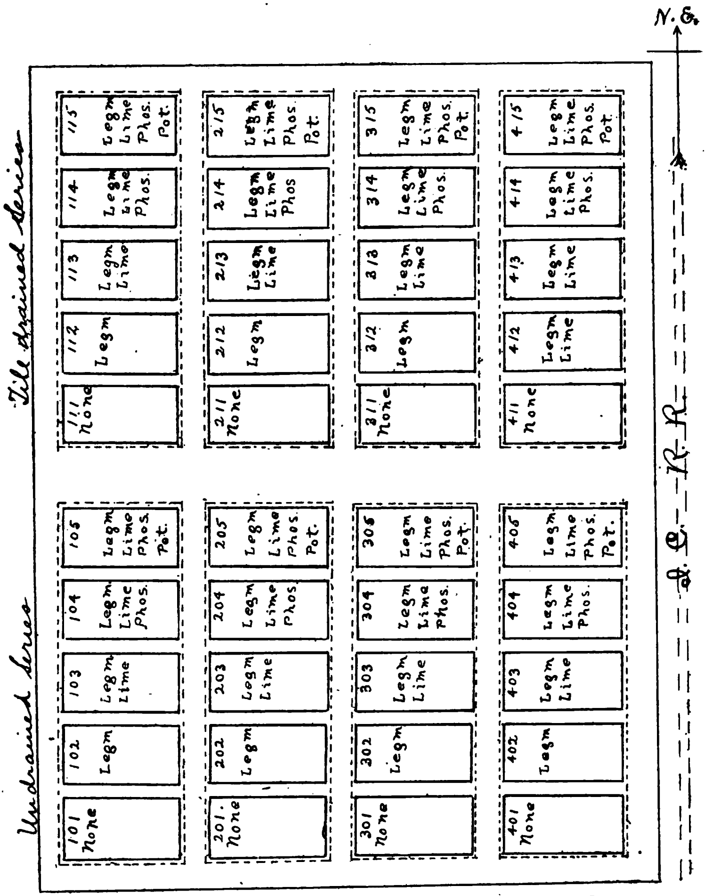

N
301 None
302 Lime
303 Lime Nit
304 Lime Phos.
305 Lime Pot.
306 Lime Nit Phos
307 Lime Nit. Pot.
308 Lime Phos. Pot.
309 Lime Nit. Phos. Pot.
310 Lime Nit. Phos. Pot.
B. & O. R. R.
201 None
202 Legm
203 Manr
204 Legm Lime
205 Legm Lime Phos
206 Legm Lime Phos Pot
207 Manr Lime Phos Pot
101 NONE
102 Legm
103 Manr
104 Legm Lime
105 Legm Lime Phos
106 Legm Lime Phos. Pot
107 Manr Lime Phos. Pot

ODIN.

This experiment field is located near Odin, Marion county, on the farm of N. B. Morrison. The arrangement of the plots and plan of experiment at this field is shown in the diagram. Eight acres are used for rotation experiments. A double set of four divisions are used, one set differing from the other only being underlaid with five lines of four-inch tile about three feet deep, the plan being to test the effect of tile drainage as compared with the usual surface drainage of the locality. The individual plots are fifth-acres. Corn, oats, wheat, and cow peas will be used in the rotation. The soil is the white prairie soil typical of this region.



Odin experiment field, located chiefly in S. W. 40 of S. W. ¼ of Sec. 14, Twp. 2 N., R. 1 E. of 3d P. M. With N. B. Morrison, Odin, Marion county, Illinois.

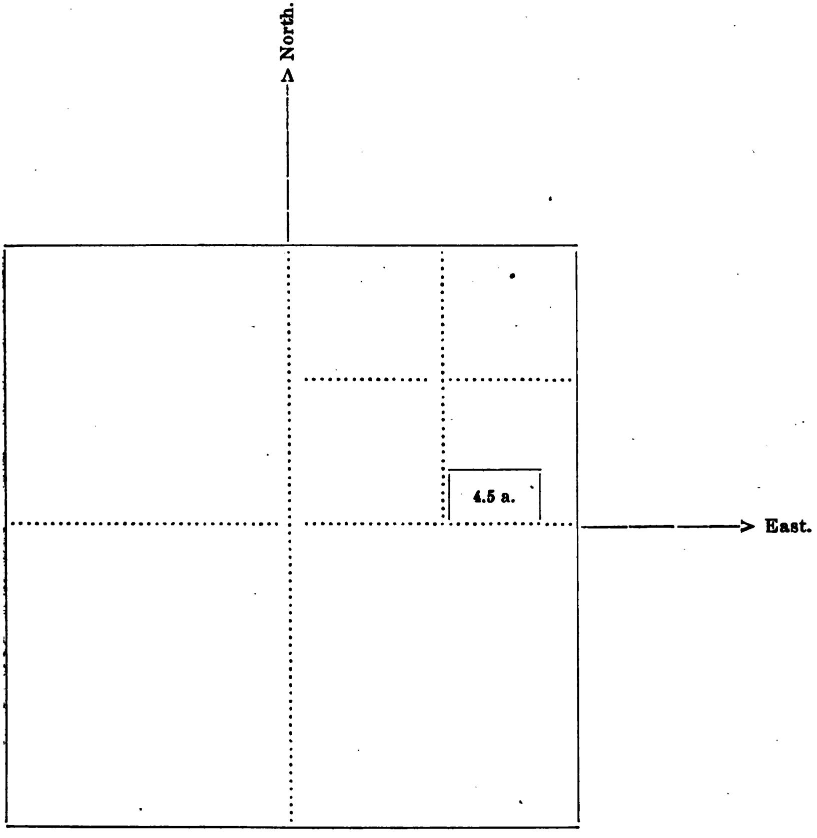


PLOT OF ODIN EXPERIMENT FIELD

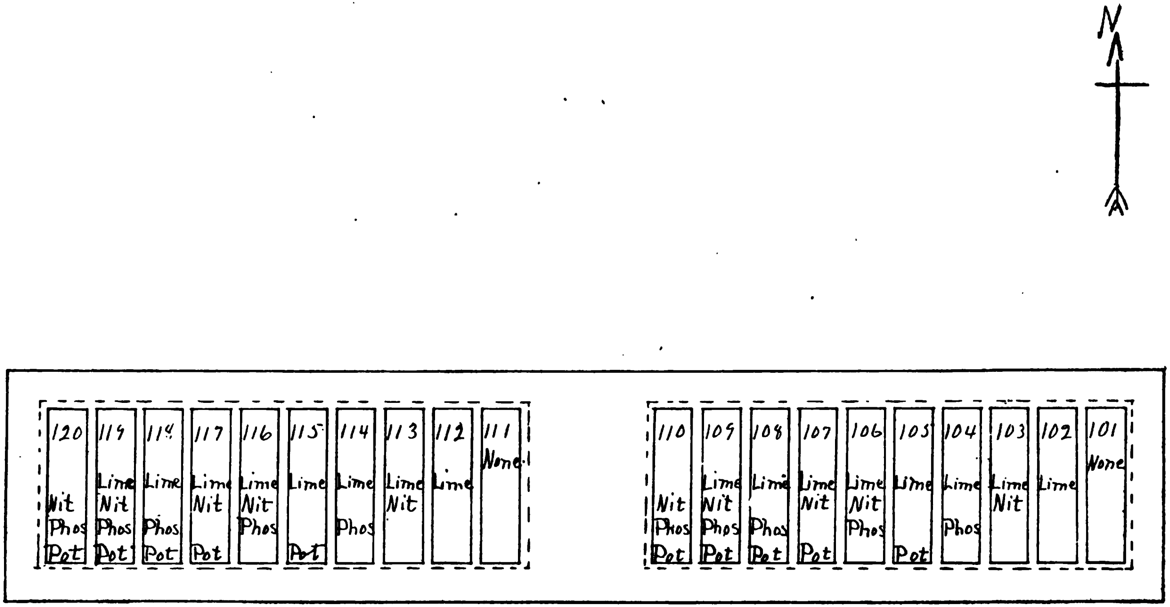
(One mile southwest of Odin. Marion county, Illinois.)

DuBOIS.

This experiment field is located near DuBois, Washington county, on the farm of A. A. Hinkley, on the S. ½ of S. E. 40 of N. E. ¼ of Sec. 29, Twp. 3, R. 1. It comprises two acres to be used for fertility tests both being treated the same as in the general plan except that one acre is underlaid with tile. The ground is level and apparently quite uniform and is typical of the poor worn white soil of this locality. This field has been cultivated about 50 years.



In the S. ½ of S. E. 40 of N. E. ¼ of Sec. 29, Twp. 3 S., R. 1 W. 3d P. M. A. A. Hinckley, DuBois, Washington county, Illinois.

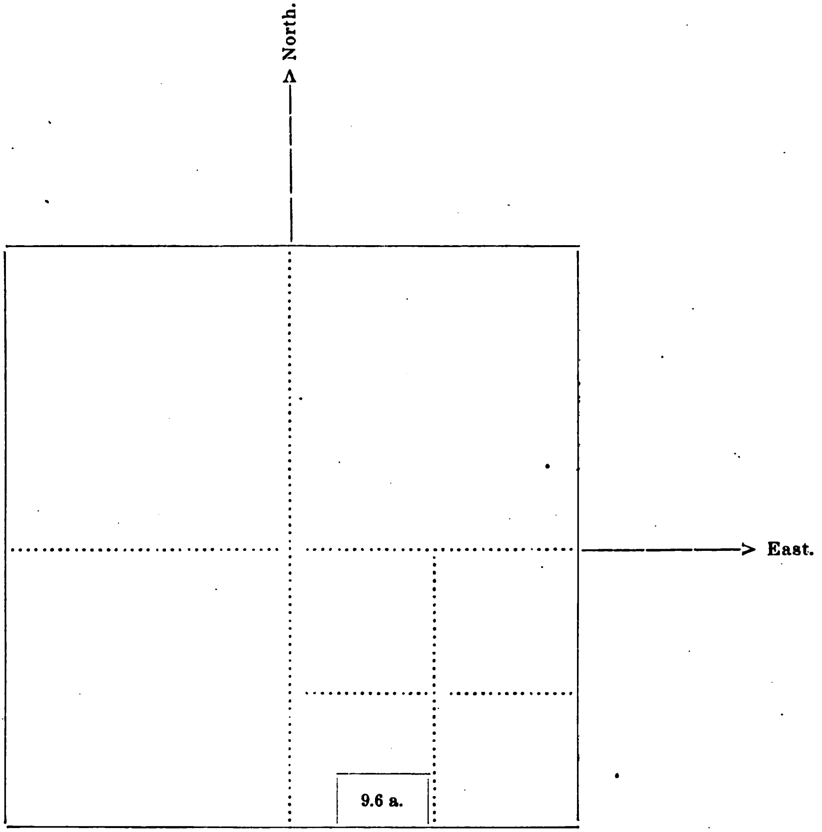


PLOT OF DU BOIS EXPERIMENT FIELD

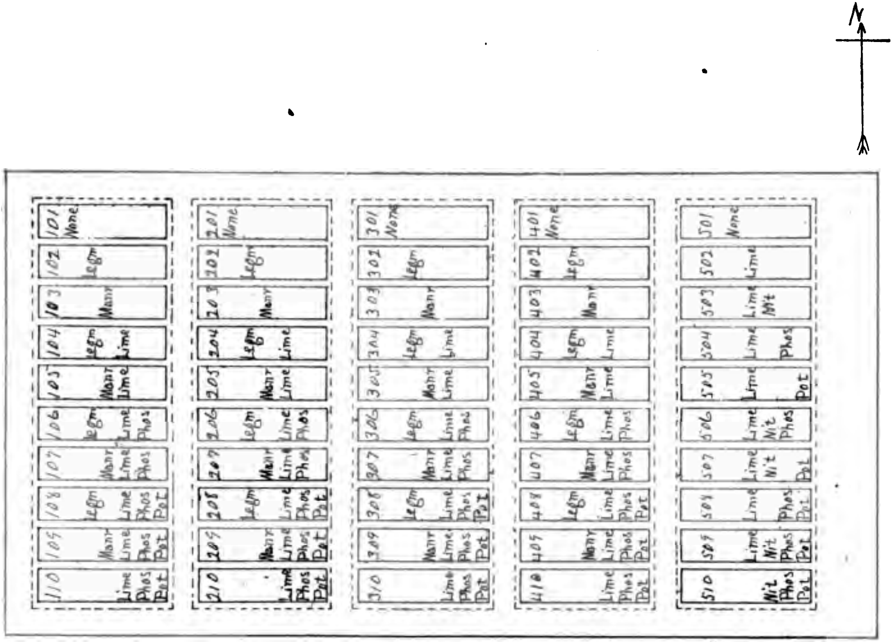
MASCOUTAH.

This experiment field is located near Mascoutah, St. Clair county, on the farm of Geo. Postel, on the S. 20 of S. W. 40 of S. E. ¼ of Sec. 17, Twp. 1 N., R. 6 W.

The arrangement of the experiments at this field will consist of the rotation and fertility tests based on the same general plan with the exception that the rotation will include four acres instead of three, wheat being included after oats; and also cow peas will be used instead of clover. The soil is representative of good well worn dark prairie; it has been cultivated about 50 years. The surface drainage is good but no tile is used. Wheat is largely grown in this locality but yields very much less than it did 30 years ago.



In the S. 20 of S. W. 40 of S. E. ¼ of Sec. 17, Twp. 1 N., R. 6 W. 3d P. M. George Pastel, (John A. Rumer), Mascoutah, St. Clair county, Illinois.

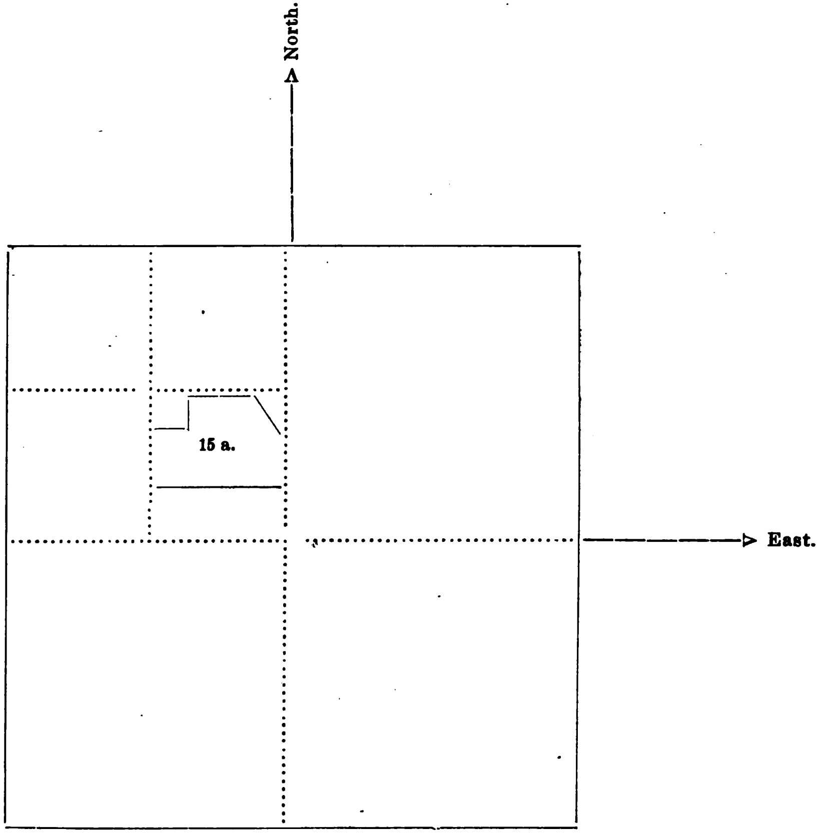


PLOT OF MASCOUTAH EXPERIMENT FIELD

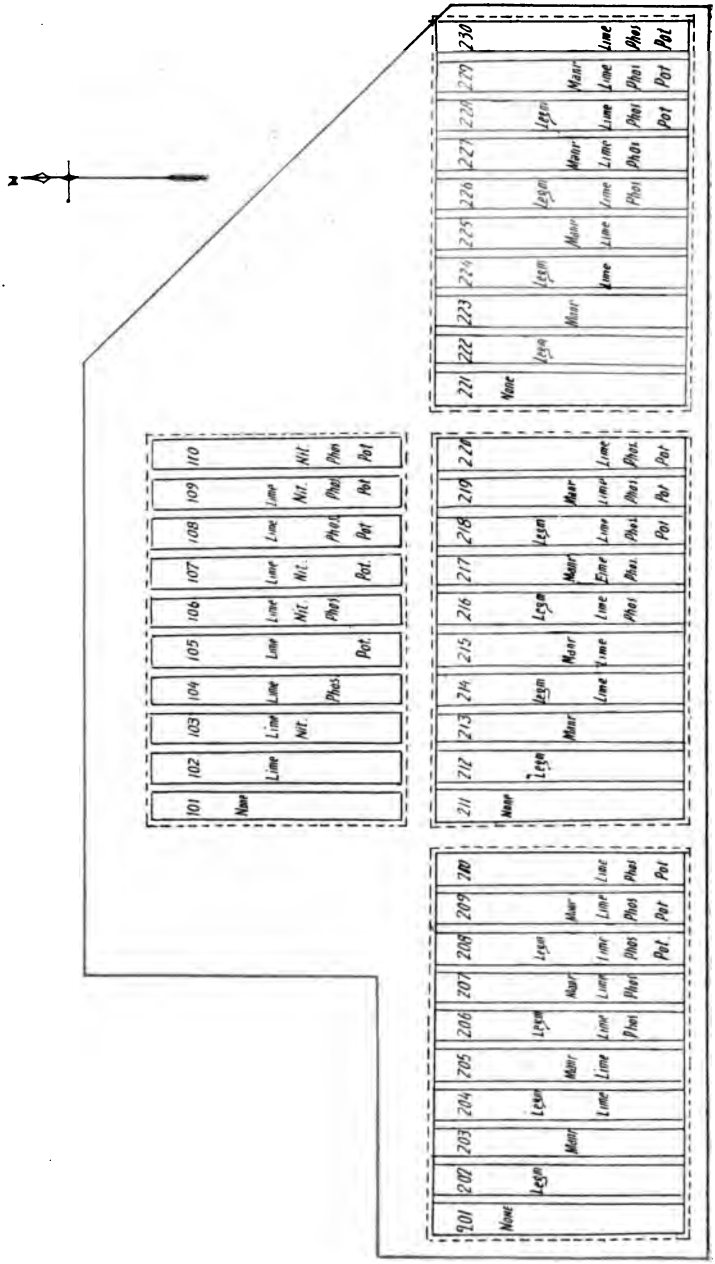
CUTLER.

This experiment field is located near Cutler, Perry county, on the farm of W. E. Braden, on the N. ½ of S. E. 40 of N. W. ¼ of Sec. 19, Twp. 5 S., R. 4.

This experiment field will be conducted with the rotation and fertility tests though the plots are differently placed and are double in size consisting of two acres each instead of one, and in the rotation wheat and cow peas are used instead of oats and clover. This field has been in cultivation about 50 years. Wheat was grown upon it continuously from 1860 to 1882 when its productive capacity became reduced. Since then rather poor crops have been produced. The soil is a clay loam, quite level, has fairly good surface drainage, and is without tiling.



N. ½ of S. E. ¼ of N. W. ½ of Sec. 19, Twp. 5 S., R. 4 W. 3d P. M. W. E. Braden, Cutler, Perry county, Illinois.

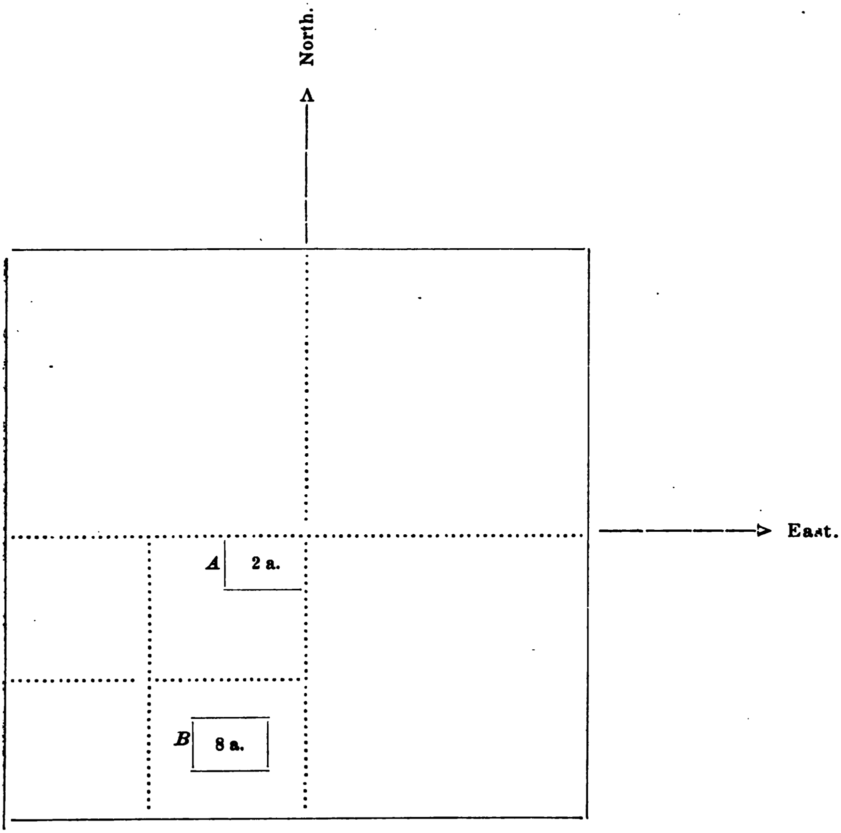


Plot of Cutler Experiment Field.

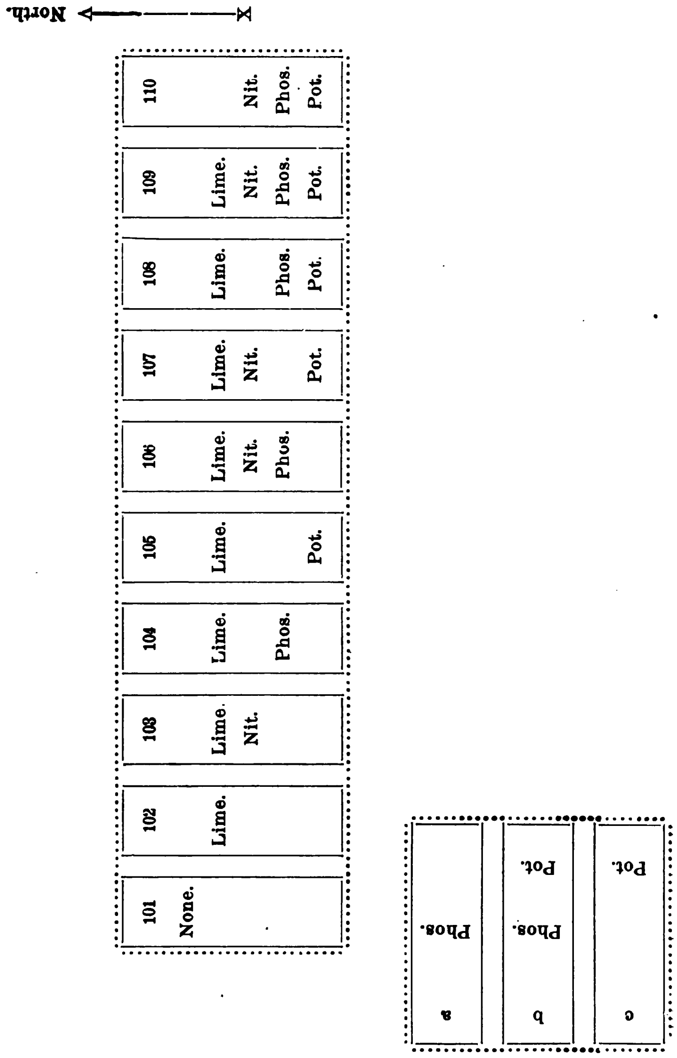
TAMPICO.

This experiment field is located near Tampico, Whiteside county, on the farm of J. H. Milligan, on the E. ½ of S. W. ¼ of Sec. 6, Twp. 19, N. R. 7 E., 4th P. M.

This experiment field consists of two plots of ground, one of one acre, the other a small tract, and both to be used for fertility experiments with corn. One acre is in typical so-called "poison land" on swamp soil. The surface is a dark loose organic soil, the sub-surface is dark and semiplastic, and the sub-soil very light to yellow sandy clay. Below 30 inches quite clean sand is found. Good corn grows on this soil when it is well manured and also where the sub-soil, as from ditches, is mixed with the surface soil. Oats grow fairly well on the "poison land," but are of light-weight. Where corn grows it usually has large stalks but bears small ears. In practice such land is allowed to lie idle for a season and then cropped with oats.



A—N. ½ of N. E. 10 of N. E. 40 of S. W. ¼; *B*—W. ½ of E. 20 of S. E. 40 of S. W. ¼, Sec. 6, Twp. 19 N., R. 7 E., 4th P. M. J. H. Milligan, Tampico, Whiteside county, Ill.

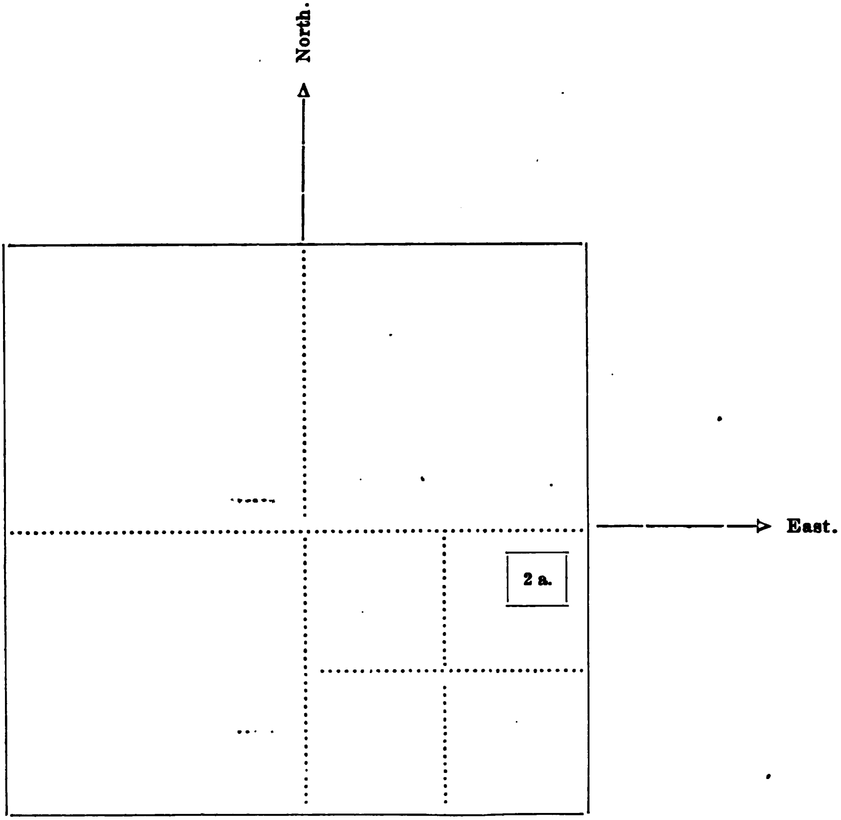


Plot of Tampico Experiment Field.

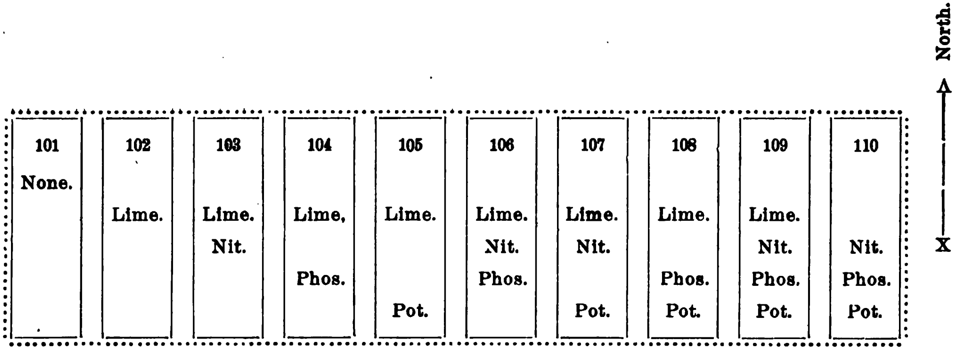
MOMENCE.

This experiment field is located near Momence, Kankakee county, on the land of C. C. Porter, on the N. E. 10 of N. E. 40 of S. E. ¼ of Sec. 6, Twp. 30 N., R. 11 W. 2nd P. M.

This experiment field is composed of one acre devoted to the fertility test and is located on unproductive swamp soil, the surface of which is black peat with some sand; the sub-surface is black clayey soil, rich in organic matter; the sub-soil is a stiff, yellowish, sandy clay, with soft lime rock about 33 inches below the surface. Corn and millet on this land grows a few inches high then turns yellow and dies out almost completely. Oats do better, but the grain is light in weight though the straw grows rank. The soil produces better on spots where hay cocks or stacks have been burned.



N. E. 10 of N. E. 40 of S. E. ¼ of Sec. 6, Twp. 30 N., R. 11 W., 2d P. M. C. C. Porter, Momence, Kankakee county, Ill.

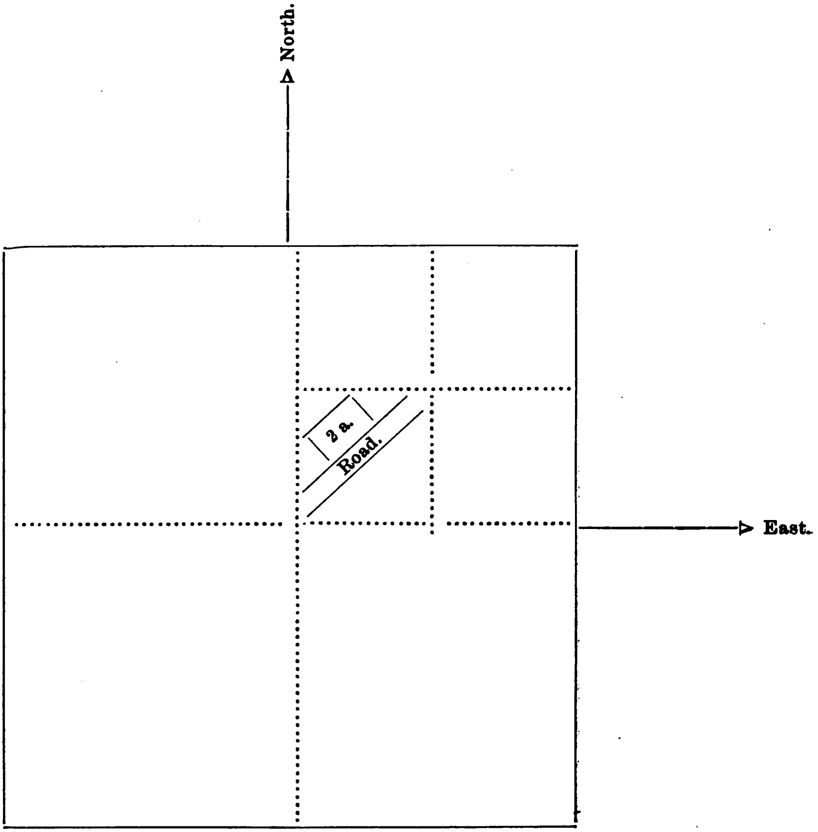


Plot of Momence Experiment Field.

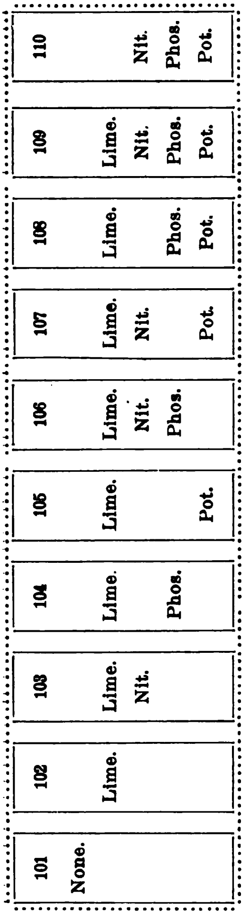
ANTIOCH.

This experiment field is located near Antioch, Lake county, on the land of D. M. White, on the S. W. 10 of the N. W. 40 of N. E. ¼ of Sec. 22, Twp. 46 N., R. 10 E., 3rd P. M.

This field is composed of one acre devoted to the fertility test and will be planted to corn. It is located on the old hill soil, the surface being dark clay, the sub-surface medium dark, and the sub-soil yellow clay. It represents the largest class of cultivated soil in this part of the State and still yields corn at the rate of 30 bushels and oats 50 bushels.



N W. 10 of S. W. 40 of N. E. ¼ of Sec. 22, Twp. 46 N., R. 10 E. 3d P. M. D. M. White. Antioch Lake county, Illinois.

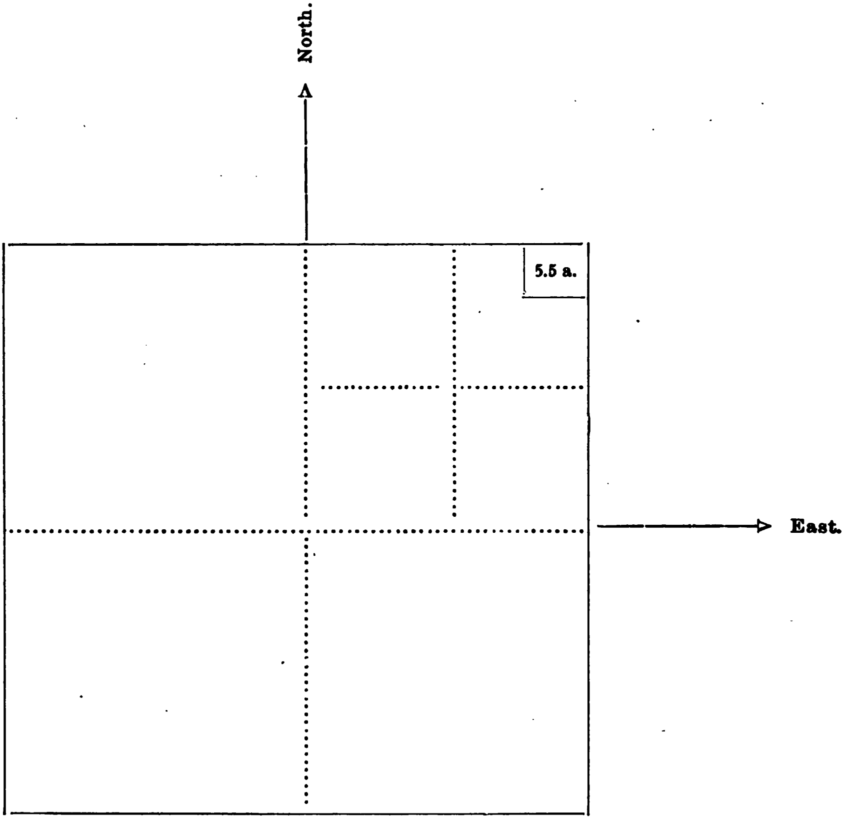


Plot of Antioch Experiment Field.

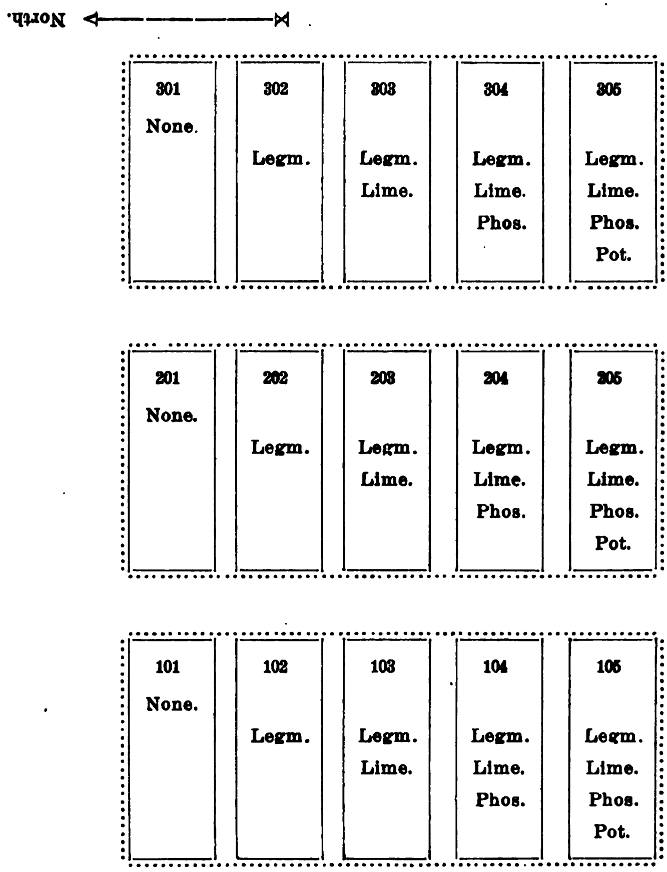
VIENNA.

This experiment field is located at Vienna, Johnson county, on the farm of J. M. Price.

At this field three acres have been plotted for rotation experiments. The acre intended for fertility tests has not yet been located as it was found difficult to procure sufficiently uniform ground. The soil is dark red with red and gray sub-soil. It fairly represents the hill or upland soil of the unglaciated area of southern Illinois. This field has been in cultivation about 50 years and still produces an occasional crop of 25 to 30 bushels of corn per acre. It is well adapted to wheat.



The N. E. 10 of N. E. 40 of N. E. ¼ of Sec. 9, Twp. 13 S., R. 3 E., 3d P. M. J. M. Price, Vienna, Johnson county, Ill.



301 None.	302 Legm.	303 Legm. Lime.	304 Legm. Lime. Phos.	305 Legm. Lime. Phos. Pot.
201 None.	202 Legm.	203 Legm. Lime.	204 Legm. Lime. Phos.	205 Legm. Lime. Phos. Pot.
101 None.	102 Legm.	103 Legm. Lime.	104 Legm. Lime. Phos.	105 Legm. Lime. Phos. Pot.

Plot of Vienna Experiment Field.

POT CULTURE.

In order to assist in the investigation of the needs of the soil at the experiment field a system of pot cultivation will be carried on at the experiment station greenhouse at the university. For this purpose large samples of soil (several bushels) are taken from the fields. This soil will be used to conduct experiments similar to and corresponding with the so called straight fertility tests. Thus ten four-gallon jars, made for the purpose, will coincide with the field tests and be treated with fertilizers the same as is done in the case of the ten tenth-acre plots in the fertility tests. Besides the ten jars, there will be two others (making 12 in all) to be used as supplementary check plots. Pot cultivation is now in progress with soil taken from four experiment fields and one other locality; namely, Green Valley, Momence, Tampico, Odin and Manito. Wheat will be grown in the pots representing the field at Odin; in the others, millet will be grown, as that plant very much resembles corn in its adaptability to different soils. (Corn itself is not adapted to pot culture experiments.) The object to be attained by the aid of pot cultivation is to determine the acidity of these different soils and to determine the amount of lime needed to neutralize this acid.

The quantity of fertilizers used for each jar will be as follows:

Dried blood, 74 grams.
Potassium chlorid, 14 grams.
Bone meal, 16 grams.

The water to be used in these pot cultures needs to be of sufficient purity that its use would not interfere with accurate results. On account of the minerals in solution in ordinary well water, that can not be used. Distilled water would be best for such purposes, but as this would be too expensive in the large quantities needed, rain water, the best substitute for distilled water, will be used in these experiments. To secure a sufficient supply of rain water in the purest possible condition, a 300-barrel cistern has been constructed in which to collect rain water from the slate roof of the agricultural building, this being a quarter of a mile distant from the heating plant and consequently free from coal smoke.

SOIL ANALYSIS.

The general plan of the analytical work is to examine several representative samples of soil from each of the large soil areas, which will be done both by chemical and physical analysis. Commonly three composite samples of soil are collected from each experiment field, each of these samples representing a different layer of soil.

First—The surface soil is sampled to the depth of the plow line, usually about six inches in depth.

Second—The sub-surface soil is sampled from the plow line of the sub-soil line.

Third—The sub-soil is sampled from the top line of the sub-soil to the depth of $3\frac{1}{2}$ feet.

Each of these three composite samples is made up from a large number of single samples taken from different places in the field.

CHEMICAL ANALYSIS.

Chemical analysis of soils may be made in several ways, for example, the total quantity of all the elements in a soil may be determined, but, as a part of several of the elements of fertility is present in most soils in such an insoluble form that they will probably never become available for plant food, at least not for many centuries, results secured by this method frequently do not admit of ready application in farm practice. On the other extreme, analyses may be made whose purpose shall be to determine only that part of the elements of plant food which is readily or immediately available to plants, but, because of the fact that the available plant food in any soil changes from month to month as it is influenced by the action of heat, air, moisture, soil gases, organic acids, bacteria, etc., information furnished by this method is usually very temporary and would not admit of extended application.

The most satisfactory method of soil analysis and that which is being used in the investigation of Illinois soils is to determine the kind and quantity of fertility which is likely to become available as plant food within a reasonable period of time—as during a long life time. The results obtained by this method usually admit of ready and extended application in practical farm management. The results show whether the soil is a normal one and contains a normal amount of all the elements of plant food in such a form that they are likely to become available during a period of time in which living men are interested; or whether the soil is an abnormal one which may contain a large excess of one element of fertility and be a normal soil in other respects or it may be very deficient in some elements and contain normal amounts of all the others.

COST OF ANALYSIS.

The cost of making a complete chemical analysis of a single sample of soil is from $20 to $40. This is due to the fact that expensive chemical apparatus and valuable chemicals are required in the work and that the work itself must be performed by a skilled analyst who has spent years at study in learning to do the work. The process of the analysis of a soil extends over about four weeks time; but, by carrying on the analysis of several soils at a time, one chemist is able to complete the analysis of five samples per month. Each analysis is also made in duplicate in order to correct any errors which might occur. It will thus be seen that to make the analysis of three samples which are usually collected from the field will cost about $100. It may be mentioned incidentally that the total appropriation for soil investigation amounts to about 5 cents per quarter section of Illinois land. These facts being understood it becomes evident to any one that the samples of soil which are to be analyzed should be collected with the highest possible scientific accuracy by an experienced soil collector and also with the assistance or coöperation of intelligent and practical farmers who are thoroughly familiar with the previous history and known characteristics and extent of the soil, in order that the samples collected may be truly representative of the type of soil which is being investigated. All samples which are being analyzed have been thus carefully collected and these samples are from soils representing tracts of land of large area.

NEW METHODS ORIGINATED.

Besides the work of analyzing soils, it has been found necessary to do a considerable amount of preliminary work in studying and improving the methods adopted by the association of official agricultural chemists for separating the alkalies, potassium and sodium, from other elements, by precipitating the other elements by barium hydroxid and then precipitating the excess of barium by means of ammonia and ammonium carbonate, does not give exact results, as the ammonium carbonate fails to completely remove the barium, and consequently leaves a part of the barium in solution with the alkalies. Usually this error amounts to about ten per cent of the alkalies, and, in case the quantity of potassium and sodium in the soil is very small, the per cent of error is still higher. It has been found that by using ammonium sulphate after the ammonium carbonate the barium can be completely removed and exact results secured.

SOIL PHYSICS.

It is the intention of this division of soil physics to supplement the chemical analyses of soils with mechanical analyses, to classify the clay, loam and sandy soils and to determine if the infertility of any soils is due to bad physical conditions.

Considerable study has already been done by this division of the experiment station relating to the subject of soil acidity. This condition of soil is liable to be present in any soil of granitic origin, and may be present at any time when the soil is continually cropped, or where there is a deficiency of lime. Agricultural plants do not prosper in soils that have become acid. Clover is especially sensitive; it will not germinate in acid soils and dies out if this condition prevails after the clover has become more nature. All the soils examined by the experiment station will be tested for acidity in order to determine how prevalent this condition exists in the soils of the State.

In pursuing this line of investigation, it became evident that it is important and necessary to know not only whether a soil is acid, but to know the degree or amount of acidity that is present in the soil. Lime is used as a corrective to acidity, but as long as the amount of acidity, is unknown the amount of lime needed to correct this condition would also be unknown so that in practice either too much or not enough lime would likely be used. There being no known method for determining the amount of acidity in a soil it became necessary on the part of the experiment station to originate such a method, the result being the following process:

The soil is treated with a 5 per cent solution of potassium chlorid, the humic acid of the soil unites with the potassium chlorid, and liberates the hydrochloric acid which is soluble in water, the humic acid being nearly insoluble. An aliquot part of this solution of hydrochloric acid is titrated against a standard alkaline solution and the amount of hydrochloric acid liberated is determined. From these data is computed the amount of lime required to correct or counteract the acidity of the soil.

SOIL SURVEY.

It is also expected that the experiment station in coöperation with the bureau of soils of the United States department of agriculture, will begin a soil survey in Illinois. It is probably that at least 1,000 square miles will be studied and accurately surveyed and mapped according to types or classes of soils during the present year. The plan of the soil survey will be to cover a narrow strip of country, probably six miles (one township or range) in width for as great a distance and over as many different types of soil as possible for the limited amount of funds which can be devoted to this work. Representative samples of the different types of soil found will be collected for subsequent analysis. The plan (in the survey) will be to map the portion of the State covered by the survey; classify the soils into the different types, and make an accurate account of the different kinds of soil that cover an area of any extent, a careful record being kept of fields as small as ten acres. The accuracy with which it is expected to conduct this survey is such, that a study of the soil maps which are to be made, together with the results which are secured by analyzing the typical samples, and other data records which will finally be published should reveal with a high degree of accuracy the character of the soils of every quarter section of land covered by the survey. Ultimately such a survey will probably be extended over the entire State.

REPORT OF WORK IN SOIL BACTERIOLOGY.

In reporting the general character of the work which it is proposed to undertake along the lines of investigating the most vital problems connected with the bacterial activities in the soil it may be well to mention first, the progress which has already been made and second to suggest some of those possible lines of research which would seem to lead in the direction from which the most can be hoped in the way of useful results.

At the beginning of the fiscal year the experiment station was not provided with a laboratory or the conveniences needed for carrying on investigations in soil bacteriology, and it became necessary to devote a large portion of the funds which could be set aside for this special line of work to the fitting up and equipping of rooms for laboratory purposes, and to the purchase of apparatus. These rooms consist of one laboratory which it is proposed to devote entirely to experiment station uses, and of a store room, an incubating room, and an animal room, which are designed to be used conjointly by the experiment station and for college purposes. Space for these purposes was obtained upon the third floor of the building occupied by the college of agriculture, and the work of enclosing and equipping the rooms was begun immediately. Furniture has been ordered and installed, and the needful apparatus obtained, and it is hoped that this work which is now in progress may be sufficiently advanced so that the rooms may be occupied before the end of the present quarter. While this work has been in progress some time has been devoted to the study of the nitrifying organisms contained in certain soils from the college farm and the bacteria concerned in the causation of the tubercles of the cow pea and the fixation of atmospheric nitrogen by these plants.

Several important lines of investigation have suggested themselves which may be mentioned to indicate the nature of the lines along which it is believed that the researches in this subject should be directed. These researches naturally group themselves into three classes, according to the subjects with which they deal, as follows:

a. Problems relating to the so-called rhizobia or organisms which give rise to the tubercle formation and fixation of atmospheric nitrogen by leguminous plants.

b. Problems relating to the nitrifying ferments which have to do with the transformation of organic nitrogen to the form of nitrates and with the process of nitrification as it occurs in soils.

c. Problems relating to soil bacteria in general and in particular to those changes that they bring about which are of economic importance to agriculture as decomposition and the solution of plant food in the soil.

The great importance of the role which the leguminous plants play in our system of agriculture is so thoroughly understood that there can be no need of emphasizing the benefit of a more definite and complete knowledge concerning the bacteria which confer upon these plants their greatly increased value. Little has been learned of these bacteria beyond what was required to establish their casual relation to the process of nitrogen fixation as it occurs in the plants of this family, and there are many problems connected with their activity, the solution of which would either be of direct practical value or throw important light upon other questions. Some of these problems relating to the rhizobia which need further investigation may be stated as follows:

1. The discovery of better methods for cultivating them in artificial media for purposes of study.

2. The determination of the number of species which exist if there are distinct species.

3. The establishment of the relation of the species to each other, the determination of the various species of leguminous plants which each may inhabit, and the relative effect of each upon these plants.

4. The establishment of the complete life history of each species and their place in the vegetable kingdom, as bacteria, yeasts or higher fungi.

5. The determination of the inherent differences between the legumes and other plants which enable the rhizobia to inhabit one and not the other.

6. The determination of the presence or absence of rhizobia in certain soils where some legums fail to thrive and of the effects of seeding experiments upon such soils.

7. The determination of the influence of various soil conditions as temperature, moisture, content of organic matter, and of various soil treatments, as liming, fertilizing and methods of culture upon the activities of these organisms.

Of no less importance to agriculture than the problems just mentioned in relation to the rhizobia are those which refer to the growth and development of the nitrifying ferments in the soil. It is clear that these questions must become of increasing importance in the future as the organic portion of our soils is diminished and the sources of nitrates become more and more exhausted. Some of the problems which will be of interest in this connection are:

1. The determination of the exact part which these germs play in the process of nitrification.
2. The determination of their presence or absence in certain soils and of the effects of seeding where they are naturally deficient.
3. The complete study of the life history of each species and of the conditions of their growth in the presence of organic substances.
4. The effects of certain soil conditions and treatments upon their activity and the resulting production of nitrates.
5. The determination of the history of the nitrates which are produced in this way.

In regard to the changes brought about by the great bacterial flora of the soil, which are important to agriculture, we have only learned enough to lead to the belief that they are of the greatest importance. It has been shown that the various changes taking place in the process of decay which is indispensable in the return of dead organic matter to the condition where it may again serve as plant food are all dependent upon bacteria or other low forms of plant life, while the solution of the mineral elements of plant food in the soil is largely brought about by acids which are produced during these changes. Of the exact nature of the processes we know, as yet, practically nothing, though enough has been established to prove that our soils were first rendered inhabitable by the higher orders of cultivated plants through the agency of bacteria and that it is only by the continual activity of these lower forms that our agricultural plants are enabled to exist.

Examples of important problems which yet remain to be solved by researches along these lines might be multiplied indefinitely but a sufficient number have been mentioned to indicate in a general way the trend which it is believed the investigations should follow.

RESULTS FROM LABORATORY WORK.

The progress of the work done at the experiment station laboratories has thus far been largely preparatory. In the laboratories of soil physics and bacteriology it was necessary to commence at the very beginning of establishing a laboratory, the designs for much of the furnishing and apparatus had to be made before the orders could be given for their manufacture.

It may not be out of place in this connection to mention that the work of soil investigation as undertaken by the State of Illinois at the Agricultural Experiment station is in advance of that undertaken by any other investigators. Very much of their work is entirely new, so that those engaged in making this investigation must of necessity rely upon themselves very largely for methods and designs for conducting the work.

Some progress has thus far been made in the chemical analyses of soils, though not of sufficient extent that your committee thought advisable to include the results in the present report.

LEASES.

The business relation existing between the Illinois Experiment station and the different owners of land upon which these substations are located is, that the Illinois Experiment station pays a cash rental varying from $2 to $8 per acre according to the prevailing rates in the respective localities. The owner or farmer is expected to do all the work of preparing and cultivating the ground, applying fertilizers, etc., supplying all labor, teams, and such tools as he may have, for which the experiment station pays the customary wages, the station supplying such special tools, seeds and fertilizers, as may be needed. Under this arrangement the crops and forage grown upon the experiment fields will become the property of the experiment station and may be sold to the farmer owner, if he wishes to purchase, or to any other parties. The proceeds of these sales of crops will, as per section 8 of bill 315, revert to the fund for soil experiments to be used "for further extension of the work outlined." Leases or contracts covering the above points will be drawn between the several parties concerned. It is also understood that the relation between the experiment station and farmers coöperating in this work is such that the farmers are supposed to neither gain nor lose financially because of the fact that the experiment fields are located upon their lands.

APPORTIONMENT OF FUNDS.

The fund of $10,000 appropriated by the legislature to the Agricultural Experiment station for soil investigation is being used to meet the expenses of the several lines of investigation, approximately as follows:

Salaries of employés	$4,000 00
Conducting soil survey and maintaining experiment fields	3,000 00
Equipment and furnishing laboratory of soil bacteriology	1,000 00
Equipment and furnishing laboratory of soil physics	1,000 00
Apparatus and supplies for chemical laboratory	500 00
Equipment for pot culture laboratory and constructing cistern	500 00
Total	$10,000 00

The furnishing and equipment of the soil bacteriology, soil physics, and pot culture laboratories, the construction of the cistern, and to some extent the purchase of apparatus and necessary furnishing together with changes required in the arrangement of rooms in the agricultural building to make them suited to this kind of work are of a permanent nature and will not be repeated next year, This applies also to the purchase of special tools or implements required for the experiment fields.

EMPLOYES.

There are now ten persons doing work for the soils department of the Illinois Experiment station, namely:

C. G. Hopkins, M. S. Ph. D., Agronomist and chemist.

L. H. Smith, M. S., chief assistant in chemistry.

H. E. Ward, M. S., chief assistant in soil bacteriology.

W. H. Knox, M. S., chief assistant in soil physics.

J. H. Pettit,* Ph. B., assistant in chemistry.

E. M. East, B. S., assistant in chemistry.

W. F. Pate, B. S., assistant in chemistry.

J. E. Readhimer, field assistant.

W. T. Craig, laboratory assistant.

Clara L. McClain, record keeper and stenographer.

Mr. Smith and Miss McClain though doing work in this department of the experiment station receive no part of their salaries from the soil investigation funds, the salaries of Messrs. Pettit and Readhimer are paid wholly from this fund, while the others employed in this department are paid in part from the soil fund and in part from the university funds.

In conclusion your committee wish to express their hearty approval of the satisfactory manner in which the work of soil investigation as originally laid out is being conducted by the experiment station and of the progress now being made; and also our appreciation of the intelligent and earnest labor with which the station employés have begun this immense task.

All of which is respectfully submitted.

WALTER R. KIMZEY,
RALPH ALLEN,
H. G. EASTERLY,
H. D. HUGHES,
Committee.

REPORT OF COMMITTEE ON HORTICULTURAL EXPERIMENT WORK.

By F. D. Voris—Neoga, Ill.

One of the provisions of House Bill No. 315 passed by the last legislature appropriated $10,000 annually for two years beginning with July 1, 1901, for the purpose of prosecuting investigations and experimental work along horticultural lines to be supervised and handled by the director of the experiment station of University of Illinois and a committee of five to be appointed by the State Horticultural society.

Having been appointed a member of said committee and having been requested to report the doings of the committee's work along the lines of horticultural investigations and experiments would submit the following:

The committee was called to meet at agricultural building in Urbana the latter part of June, 1901, and organized by electing Professor J. C. Blair chairman and J. W. Stanton secretary.

Upon motion they decided first to experiment with ice cold storage, using natural ice when it can be had—decided to build one ice cold storage building—and also experiment with ice and ventilation with two or three cellars in different localities in the apple belt of our State.

The cold storage building was located at Neoga, Cumberland county. Dimensions of same are 40x80 feet and 14 feet to the eaves, a substantial structure with heavy brick foundation, the outer walls consisting of five matched three-fourth inch ceiling and double paper walls, being as near air-tight as possible for common mechanics to make them, making four complete vacuums, the outside air space continuing on up through the roof to the ventilating cupolas being an open air space carrying off the warm air, the three inner vacuums being dead air spaces have no circulation whatever.

The floor is a double tongue and grooved floor with a two-inch vacuum layed on an 18-inch well tamped coal cinder foundation for the first 50x40 feet which constitutes the cold storage room proper, and receiving room of ten feet off of one end, the ice for cooling purposes going above, there being room for from 75 to 120 tons as may be required to cool stock down with.

The remainder of the building 30x40 being the ice house for carrying stock ice for replenishing cold storage requirements, has no floor other than cinders, capacity between 500 and 600 tons which now contains 400 tons of natural ice at a cost of about $1.25 per ton which we think sufficient to carry 2,000 barrels apples from September to May or later.

We iced our cold storage room with 75 tons artificial ice Nov. 10 the building not being near enough completed before that time.

Had begun receiving apples before ice was received through force of circumstances, which would not advise being done as ice should be put in and storage room cooled first.

We received some 1,500 barrels apples and fully four-fifths of them are still in place.

We have had very little loss, not more than others have had in regular artificial storage.

From the time the ice has been put in and storage room cooled down the variation in temperature when storage room was kept closed is only about four degrees or from 32° to 36° above zero.

We consider this natural ice cold storage experiment one of the most important the committee has to deal with, showing what can be done along this line by almost any fruit grower at home on the farm.

The ice if close at hand could have been put in ice house for half of the amount this cost, it having been hauled four miles from creek, the drouth of the last ten months having left our ice ponds empty which is close at hand.

With the limited experience we have had with the ice cold storage experiment we can say we have had gratifying results, the per cent of wastage no more than in the best chemical cold storages of the country.

The ice put in the cooling loft Nov. 10 last is but very little if any over one-third melted and looks now as if sufficient to carry stock through to middle of March or first of April.

As to cooling down cellars with natural ice and ventilation will say that we have had varied success as to the completeness of the insulation and ventilation.

We experimented with a cellar at Olney, also one at Savoy.

The Olney cellar we completely insulated with double floors, ice box through which the air entered cellar and ventilating chimney running from ground to roof. This experiment proved quite gratifying and think can be made quite successful holding an even temperature of about 38° above zero.

The one at Savoy has not been so satisfactory. Not having the insulated walls or floor, we find it almost if not impossible to reduce temperature below the temperature of the earth floor, or earth about the wall or say about 48° degrees above zero, so would caution anybody preparing a cellar for cold storage purposes to thoroughly insulate all walls and floors, if not so done the warmth of the earth is almost certain to cause trouble.

Any person having a good cellar can, at a moderate expense, convert it in a small way into a practical home cold storage plant, especially where the natural ice can be secured cheaply.

At what temperature is best to carry apples in store? This question arose and we are carrying on an experiment along that line, having rented four rooms in the Twin City Ice and Cold Storage plant, located at Champaign, Illinois. The temperature is being kept in the different rooms as follows: 30, 31, 33, 35 and 37 degrees above zero, and we hope when we have more fully tested the experiment with these rooms, we having apples stored in each room, we may be able to answer the question more satisfactorily.

Bulletins a little later will be issued by Prof. Blair, showing the results of this work.

Will state that all the committee's work along the several lines has or will be issued in bulletin form and can be had by applying for them to Prof. J. C. Blair of the University of Illinois.

The field experiments were prosecuted during the entire spring and summer and in fact throughout the year, when the weather would permit, investigating and experimenting on fungus and insect pest so destructive to our orchards and fruit.

The bitter rot being one of the most destructive, especially to fruit, this one thing alone destroying $1,000,000 or more of apples in central and southern Illinois in 1900, has made greater losses and more trouble to the apple grower than any other one pest, and has given the experiment station more anxiety and trouble in apprehending and counteracting its effects.

This one thing of bitter rot has been given especial attention throughout the year, our investigations and labor along that line having been prosecuted by George P. Clinton, M. S., assistant botanist, and Arnold V. Stubenrauch, of the department of horticulture of the University of Illinois, B. S. M. S. A. For further light on this subject would refer you to Bulletins No. 67 and 68, issued by them for the University of Illinois.

We feel as if their work had been intelligently and faithfully done and will prove a blessing to the horticultural interests, especially the apple growers.

We are aware that pests and disease, contagious or otherwise, old and new, will continue to exist as long as man lives and tries to grow fruit, grain or live stock, and we all being conscious that when our horticultural or agricultural interests are adversely affected the interests of the whole State are affected, and that being the case, we would recommend that a like or even greater appropriation be appropriated by the next legislature, as is included for the different agricultural and horticultural interests in this present House Bill No. 315, that the investigation and experimental work may be continued along these various lines, thereby materially protecting and advancing the horticultural and agricultural interests of our State.

COMMITTEE ON DAIRY INVESTIGATION AND EXPERIMENTS.

By IRVIN NOWLAN, Toulon, Ill.

In carrying out the provision of House Bill 315 providing for a committee of five (5) to be appointed by the Illinois State Dairymens' association to confer with the director of the Agricultural Experiment station, the following committee were appointed: Messrs. H. B. Gurler, DeKalb; M. Long, Greenwood; A. N. Abbott, Union Grove; Irvin Nowlan, Toulon, and John Stewart, Elburn.

At the meeting held at the Agricultural college June 18, 1901, all members were present except Mr. Stewart. The committee invited Professors Fraser and Erf to meet with them to discuss the dairy conditions of the State and to jointly devise some ways and means to improve these conditions.

Upon invitation, Prof. W. J. Fraser presented some suggestions as to what ought to be done in the way of developing the animal side of the dairy industry and what investigations ought to be carried out in this line. The work agreed upon in connection with this department of the college, was as follows, given in order of importance·

1. That a man under the control of the director of the experiment station be sent over the State to do field work, with a view of studying the dairy conditions and assist in every possible manner to improve these conditions. It was suggested by Mr. Abbott, and agreed upon by all members of the committee that the greater portion of this work be carried on in the dairy districts of the State.

2. That the dairy experiments at present carried on by the experiment station in regard to determining the difference in efficiency of individual cows be continued on the United States government fund.

3. That a cheap and effective method be devised for keeping flies from cows.

4. To determine how small a quantity of milk on which calves can be successfully reared, and what food will make the best substitute for milk.

5. The immediate and continued effect of different quanities of the same kind of feed on the production of milk of cows.

6. Wide vs. Narrow Rations for Dairy Cows, and to determine the widest ration most economical for conditions that exist in Illinois.

The investigation and experiment work on the manufacturing side under Prof. Erf was given due consideration, and the following suggestions, in order of importance, were agreed upon:

7. Experiments on whipping cream, explaining why some cream whips, while other cream of same per cent does not.

8. Testing different insulations for creamery refrigerators.

9. Experiments on mold in refrigerators.

10. Experiments to determine the species of bacteria that causes butter to deteriorate at low temperature.

11. Experiments in making butter from cream which has been frozen.

Such is the work mapped out by the advisory board, and it is with a feeling of pride I make report of the progress that has been made in this department.

One of the most neglected things about the dairy farms is the sanitary conditions of the barns, and it was thought best that the University of Illinois set an example in this respect for the dairyman of the State by putting the dairy barn at the experiment station in the best possible condition. The floor, joist and sills of the university dairy barn were badly rotted and unsafe for longer use, then it was thought best to tear out the whole inside of the dairy barn, new sills were put in where needed, the loft supported on iron columns, new windows put in giving four times the light originally. The barn was ceiled on the inside, a large feed room partitioned off at one end for the preparation of feed for experimental purposes, at the other end a milk room, an office and a herdsman's room were put in. A cement floor and mangers were put in 3 feet lower than the old floor and resting on the ground.

Considerable time was spent investigating the stall question, and it was finally decided by putting in the Drown iron stall. These stalls were the second lot manufactured and they are giving excellent satisfaction. This makes a good barn for experimental work, and with the small dairy building standing near it, which has also been remodeled, makes one of the best dairy plants in the State from a sanitary standpoint.

The work in the field is being done by Mr. Glover in the dairy section. He is testing herds as follows, visiting each every seventh week:

Name.	Residence.	Cows Tested.
H. B. Gurler	DeKalb	65
F. M. Barber	Greenwood	25
J. M. G	Greenwood	30
Ray Wilson	Greenwood	30
M. S. Campbell	Genoa	18
W. C. Taft	Rockford	18
Chas. Gilkerson	Marengo	10
S. Seward	Marengo	6
W. R. Hostetter	Mt. Carroll	20
H. M. Phillips	Lena	20
S. M. Malnix	Damascus	15
E. G. Helm	Freeport	6
—— Smith	Aurora	7
J. F. DeGarmond	Genoa	6
Z. F. Burland	Woodstock	30
J. F. Hordel	Lena	10
J. A. Phillips	Lena	9
H. J. Younger	Stillman Valley	30

Making a total of 355 cows being tested without any expense to the owners excepting what little time is required to weigh the milk, etc.

This method of testing cows every seventh week by a representative of the experiment station can not help but add untold benefit to the dairy industry of the State. Applications have been coming in from dairymen to Mr. Glover to test their herds, and many have had to be refused on account of lack of time.

Thus the light is breaking upon the dairyman that to be successful in his business he must needs know his individual cows so that the poor cows may be weeded out, this is perhaps one of the most important matters to be considered by the up-to-date dairyman.

Experiment No. 2 is being continued on United States funds.

Experiments 3, 4, 5, 6, 7, 8, 9, 10 and 11, with no definite results as yet.

The matter of whipping cream at different per cents of butter fat at different degrees of temperature and differnt per cents of accity has been taken up and a number of data have been obtained, but on account of the intricate factor of viscosity which enters into the work, there will be some problems that can not be solved except by very expensive and elaborate experiments.

Refrigeration has also been duly considered and approximate estimates were made as to the probable cost of such an experiment in order to secure such results that may be helpful to the average creameryman and still stay within reasonable bounds of our appropriation. Unforseen circumstances do occasionally arise in experimental work and it often becomes very expensive to avoid the obstacle, but trusting that nothing of the kind will arise and with well laid plans to make a thorough test of all factors that enter into this work; but it will require considerable time if the experiment is to be conducted in a thorough and economical manner, this will especially be true of the deterioration test of different insulating materials.

Such has been the progress of the work done by the dairy department of the agricultural college upon the plans laid out by the advisory board.

Respectfully submitted,

IRVIN NOWLAN.

REPORT OF COMMITTEE ON SUGAR BEET INVESTIGATION AND EXPERIMENT.

By R. S. Woodview, Urbana, Ill.

Agriculture in the United States and in Illinois has undergone a great change within the last 20 years. There has been no science, no business enterprise, no profession that has kept the pace with the advance in scientific agriculture. New methods for the culture of older established grains grasses have placed them under control of our agricultural specialists.

New crops has been grown and found their adaptations to our soil, climatic and moisture conditions. Plants have been taken in their wild stage and in the hands of the plant breeder have been developed into plants that have been cultivated to the extent that they affect our commercial enterprise to a very large degree.

The sugar beet as an example has been bred up from a sugar content of 4 per cent to 14, 16 and 22 per cent.

There is a reason for all these things, manufacturing interests now realize the importance of scientific methods of agriculture to produce the raw material passing the highest degree of perfection.

There is a place in agriculture for the sugar beet industry, in a county that last year consumed 2,372,316 tons of sugar, and where the per capita of consumption has increased from 20 pounds in 1830 to 63 pounds in 1900 and 1,750,000,000 people of the world consume 7,500,000 tons of sugar, the United States is now consuming 28 per cent of this amount with her 74,000,000 people. We rank second only to England as a sugar consuming nation yet in 1899 to 1900 we produced but 205,000 tons.

There are 41 beet sugar factories in operation in the United States against 1,400 in Germany, Rusia, France and Austria,

The United States produced in 1900 from her beet factories 73,000 tons of sugar.

It is interesting to watch the progress of the development of the sugar beet industry, and it leads fair to figure largely in our economic conditions.

It means intensive agriculture, smaller farms more farmers with larger returns, it means neater and better kept farms, and encouragement to young men with ability ambition, and pluck.

Illinois has a yearly consumption of about $18,000,000 or equal to the value of our whole oat crop.

It would add to Illinois' wealth to produce her own sugar $13,500,000 in beet factories. It would require as yearly average of about 180,000 acres, furnishing employment to many men in field and factory that are now idle in Illinois.

It would stimulate other lines of work and create a greater demand for other crops. It would furnish a new feed for dairymen and feeders in the way of by porducts.

On account of the results of experiments over the State of Illinois conducted by Prof. P. G. Holden and published in 1898 in Bulletin No.. 49. from the College of Agriculture, Urbana, Illinois, and on account of the stimulating effect the two years of sugar beet culture in Illinois had upon other lines of farming. The Illinois Beet Growers association took active part and secured an appropriation for further experiments to be conducted in Illinois as part of House Bill 315.

As an outline of this work a committee from the Illinois Beet Growers association submitted the following report for experiments to be conducted in Illinois with funds received from House Bill No 315. This report was approved by Dean Davenport of the Illlinois College of Agriculture.

It is evident that the value of experimental work depends upon the care with which it is done and the accuracy with which directions perscribed are followed.

To this end it is recommended that a series of experiments be conducted and extended over the state, which will contribute to giving satisfactory answers to some of the questions which are constantly being asked, and which must be answered before the sugar beet industry is fully established in this State.

This work should be in charge of an experienced man, one thoroughly posted on the sugar beet and its methods of cultivation; he should be able to enlist the co-operation of two or three score of representative farmers who can be relied upon to do good work, which can doubtless be more ecomomically done in communities having experience in the production of beets on a commercial scale.

From the supervision of this work such a superintendent should be able to give accurate data relative to beets grown, the methods of fitting ground and cultivation, time of planting and harvesting, the tonnage per acre, quality and growth of beets, moisture preccipitation amount of heat etc.

These results should mean something. The aim of such a report should be not only to demonstrate accurately the results obtained, but to convey a correct idea whether results secured were obtained under normal conditions, and whether or not they are likely to be permanent results.

To test Illinois conditions thoroughly with reference to the capacity for growing sugar beets requires a great deal of patient labor and means the abandonment of some private notions on the part of the average farmer as to "scientific farming" so-called.

A happy feature incident to this work is the cordial relation to be developed between the farmer and experiment station.

They will be gradually getting nearer to each other; the station will become more practical and the farmer more scientific.

LIST OF EXPERIMENTS.

EXPERIMENTS PROPOSED:

1. Crop rotation. Beets should follow beets, or be planted on corn ground or wheat or oats stubbe, or seeded on newly plowed clover or blue grass sod; also what crops are best to follow beet crop.

2. Preparation of seed bed and cultivation of beets, the merits of fall and spring plowing, early and late, or deep or shallow, both in fall and spring. Firm versus loose seed bed, tools best adopted to fitting ground, time various depths of planting, spacing rows, when to bunch and thin, and distance of cuts in rows, as well as the effect of distance apart between beets upon both the tonnage and sugar percentage.

3. Investigation to determine types of soil in the State which are best adapted to the production of sugar beets and value of manure and commercial fertilizers, and manner of applying the same. It should be the aim to demonstrate the facts and conditions that might obtain in a general way by showing results through efforts directed in a small way. The plots of land

selected should not be of the best or poorest but ones that are typically representative of the farms on which they are situated and general farming region in the locality.

4. Test of standard varieties from reliable seedmen to determine their relative value for Illinois soil and conditions, and, to a limited extent, trial of the breeding of beet seed in the suitable sections of the State.

5. Costs of various details in the producing and harvesting of a crop of beets, and investigation of the best machinery now in use, with a view of improving the efficiancy of same and thus cheapen the cost of production.

6. Insects and diseases.

7. Feeding value of beet products.

In accordance with the action and report above the writer was chosen by the trustees of the university and placed upon the experiment station staff to conduct this work.

The work was started August 10, 1901, a visit was made to the fields of the contractors of the Illinois Sugar Refining Company in McLean, Tazewell, LaSalle, Logan, Fulton, Sangamon Counties.

The history of the past treatment of these fields was taken, the previous crops, Kind of soil, drainage, depth, date and manner of plowing, preparation, whether fertilized or not and what manner, condition of ground when plowed, date and depth of planting. Size of beets when first cultivated, number of times cultivated and depth of cultivation, date of bunching and thinning, number of beets left to rod, whether or not tops died down in summer, if so the cause; results of feeding tops to cattle and hogs, date of harvesting; cost of growing and harvesting per acre.

Samples were collected from these fields by me and sent to the Station for analysis in charge of L. H. Smith. Aanalyses—in 242 samples were analysed with an average percentage for counties as follows: LaSalle county, 13 per cent; McLean county, 12.7 per cent; Menard county, 13 per cent; Tazewell county, 12.2 per cent; Logan county, 11.5 per cent; Fulton county, 11.8 per cent; Sangamon county, 10.1 per cent; seven samples from Momence, Kankakee county, averaged 14.1 per cent; from Kankakee, 14.6 per cent; Kankakee county, Waldron, 13.4 per cent; Marango, McHenry county, 14.2 per cent; Dolton, 14.6 per cent; Virgnia, Cass county, 14.6 per cent; average of 242 samples, 13.3 per cent.

Samples were taken from fields having grown four and six consecutive crops of beets, the average percentage from fields four successive crops 12.8 per cent; percentage of beets from six crops, 12.1. Tests were made of oats grown on beet ground after one and two crops. Tremont, Tazewell county Illinois, 152.22 acres belonging to Peter Getz, Fred Becker, John Hent, Fred Hunterman yielded an average of 61.2 bushels per acre. With corn only two accurate tests were obtained. H. A. Bailey Delavan grew 42.2 bushels per acre at 80 pounds per bushel on 100 acres of beet land 1901.

S. M. Woodrow, Green Valley, grew 45 bushels per acre on 30 acre beet ground.

Many other farmers have written of good crops on beet ground. Accurate figures were not obtained, because land was not measured.

From the crop of 1901 1,000 beets cf Original Klein Wanzlabia variety have been selected as mother beets and stored at the university and will be used in the breeding of beets for seed. These were packed in dry sand in a cool room of the basement and this spring will be set out to produce seed. This work will be conducted by Prof C. B. Bull of the plant breeding department.

Land has been arranged for by the station in different parts of state to test all these questions suggested by the report of the committee of Illinois Beet Growers association.

There will be 1,600 pounds of seed for distribution among the farmers who will co-operate with the station and follow directions in regard to selection of land, cultivation, harvesting, etc., and collecting data, sending, besides samples to station for analysis, 250 pounds for variety tests.

It is especially desired that the northern portion of Illinois where dairy interests are most prosperous take up this sugar beet work, for the two fit so closely together. The beet itself, the tops and by-products of factory have a feeding value to dairymen that is seldom excelled.

Coöperation with the department at Washington has been arranged for the study of insects and diseases.

It shall be the aim in this work to make an impartial test of Illinois conditions as to the advisability of growing beets for commercial purposes, but at the same time there shall be an endeavor to cheapen the cost of production and increase the quality and tonnage of beets.

The two years crops have proven that Bloomington, Illinois, is a suitable location for a beet factory. The average price received by farmers for beets in that vicinity in 1901 was $4.62 per ton. The average factory test for Bloomington beets was 14.8 per cent.

But the business of growing beets to sell is at a standstill in Illinois until a factory is established here.

No factory will be established, and not even a move for a factory will be made, until the sugar trust's fight for the removal of the raw sugar duty is settled.

The educational and experimental side of the work may continue, and it is hoped that within a year—or if the sugar trust wins now, within a few years—the condition may be favorable for taking up the practical side again.

The fact that the first Illinois sugar factory was not well located, that it gave up the business in the middle of the season because of the special advantages in the year-around manufacture of glucose, and that trouble has arisen over the shipping of the crop to other states, have all been important incidents but not essential parts of the industry, and not chargeable to the business of growing beets.

But Bloomington people, both farmers and business men, should have a clear understanding of the real conditions and not charge the present seeming failure to any but the real causes, and should hold themselves in the right attitude for prompt action when the time is ripe for getting a factory and resuming the growing of beets here.

Surely the advantage brought to our doors and well demonstrated by pioneer beet growers is not to fall to the ground and fail of ultimate fruit in Illinois farming, in producing labor for thousand, and in keeping millions of money at home.

Meanwhile the sugar factories, and beet growing well established in other states will continue to reap the abundant benefits as long as they can hold their own with the sugar trust.

THE DEVELOPMENT OF A STATE BY LEGISLATION, SUCH AS "BILL 315".

Read by E. Davenport, Dean of the College of Agriculture, and Director of the Experiment Station, University of Illinois.

It is a notable example of a deliberate act of a great State to increase its prosperity through the further development of one of her great industries—agriculture—and I crave attention for a few minutes to an analysis of the real meaning of such legislation. This I do because there seems to exist some confusion of ideas as to such matters, for I am often asked the question: "Why do we establish schools and experiment stations at public expense for the special benefit of farmers? Why not legislate for the benefit of my business as well—shoemaking, for example, or mining? Have not I as many rights as if I raised corn or fed pigs?"

Now this all seems plausible and yet it contains the fallacy of fallacies when we are considering policies for the development and the upbuilding of a state, and I apprehend that many very good people entirely misunderstand and misconstrue the plan and purpose of such institutions as colleges of agriculture and agricultural experiment stations.

For whose benefit, primarily, are the colleges of agriculture, for example, maintained? Is it for the few hundred individual young men and women who attend their classes? Is it so that they can learn better methods and thereby succeed better than their neighbors and ualtimately absorb them and their lands? No, if this were the purpose then it should not be done, or else we should also establish schools to teach shoemaking so that Jones could get Smith's business and his shop away from him.

It is not for this. It is rather that for public reasons the very best known methods of agricultural practice should be widely known among men—should be diffused among them as the atmosphere they breathe. This may be done to some extent by the public press, by books, and by special publication, but in all these cases the reader must make his own interpretation, and after all, the printed page is but a lame and awkward medium of communication. Face to face, man to man, heart to heart, is the way to absorb new ideas, and youth is the most favorable period, before the ideas and the habits are fixed, and before the man is finished.

And so it is that all human experience has shown that the most patent method of putting new ideas into the lives of a people is to teach them directly to the young, and in a generation or two they have become inbred and soon inborn into that people. What if all are not able to go and get this instruction first hand? The object will yet be accomplished, because those who do go bring it away, and they live it and teach it perforce, and so it becomes diffused among the people to the benefit of everybody, even though but a fraction may have attended the college and acted as carriers. A fire is extinguished by a bucket brigade. The benefits are by no means limited to the few individuals who carried water in buckets—that water should be carried and water enough, that was the necessary thing.

The whole fabric of our free schools is built upon this same principle, that the community as a whole should be educated; not for the benefit of the individuals as individuals, but for the common benefit of the mass. I do not believe that public money was ever spent or ever should be spent for your or my personal benefit. The state, which is the public, owes you and me as individuals nothing. We owe it everything. It will not take care of us and it ought not; it expects us to take care of ourselves and of it.

It is true that the individuals that attend any of our public institutes of learning from the district school up to the state university do get an individual and a peculiar benefit out of it. That is the good fortune of the individual, and it is recompense for his own time and money put into it, but it was not for this that the school was established.

Right here is the difference between the old and the new systems of education. In the olden times we considered education a purely personal matter; like Hancock's tariff a local issue. Then we had the "rate bill," and private schools, and every man paid for what he got. But this system of education did not educate. The education of every boy or girl was entirely at the caprice or the financial ability of the parent, the public was cheated of its right, which is that each new generation shall be better prepared for life than the last, and it was found that the education of a great people could not safely be left entirely to the individuals; that there is a public as well as a private phase of education, and that from the public standpoint the individual is simply the carrier, the avenue of diffusion of knowledge among the people, and when it comes to higher or special education the public is indifferent as to whether you or I as individuals go to college to get first hand the best that is to be had, or stay at home to absorb the influence brought away by others. In this business as many should go as is possible in order that the diffusion shall be complete, but the public is indifferent as to whether Jones shall go and Smith be a recipient or visa versa, and in this all good people are now so well agreed that the childless man pays his school tax as cheerfully as does the father of ten.

All this has been said by way of illustration only, and to show why it is that legislation such as Bill 315, which seems to be in the interest of a particular class, is not so at all. Here public money is not expended in order that Farmer Smith may prosper better, not at all. He may succeed or he may fail, and go into the grocery business and fail there for all the public cares, only so he supports himself and his without becoming a burden.

But while the public is indifferent to Smith as a farmer, it is not indifferent to farmers as a whole. It is not necessary to show here why it is that from the standpoint of public prosperity farmers as a whole succeed; that agriculture must prosper and that it must be developed, until we as a people operating in the only way possible through individuals shall learn how to get the most out of the land, and how to protect its power to produce forever.

Upon this proposition all people of all classes and professions are equally agreed and equally interested. To be sure, certain individual farmers will prosper the better because of every new fact and principle that is learned. That is their good fortune; that is an incidental individual benefit, like that which comes to the comparatively few individuals that get the most out of our great public school system. Even this, I have no doubt, will in most cases be no more than a partial return for actual outlay in time spent for the public without recompense, for it is not to be forgotten that these progressive souls who are naturally the first to take advantage of better things are the same ones that are always contributing of their time and means to public causes.

Such legislation as this is, therefore, not only indifferent as to the individual farmer, but it is not for the special benefit of farmers as a class. It is for the development of the agriculture of a great state, and, therefore, for the benefit of all people of all classes, now and always; and it is of economic importance that this development go on until the state has learned to produce the most and the best food, until it has brought the last feasible acre under profitable cultivation and until it has learned how to keep up this output for a thousand years. A thousand years? Yes, ten thousand years, if the world should stand so long.

If all this is true of agriculture it is not true in the same sense of all other needful occupations and industries? And should we not establish schools also, and experiment stations for the special benefit of the shoemaking industry, for example, or any other profession in which the public is interested? Surely the public is interested in good shoes, and in cheap shoes, and that the supply shall not fail. Is it not as much interested in mining what is a thousand feet below the surface of the earth in the shape of gold or iron as in what lies in the top foot in the shape of corn on beef? And why should not public funds be as generously devoted to the exploitation of these industries as of this one of agriculture? Are agriculture and agricultural people to be peculiar pets of the public, entitled to special privileges?

This is the question I wanted to answer. Not that it is asked derisively or complainingly, but it is often asked honestly, and it must be frankly answered before we can feel assured of the public interest and support that will be needed in order that Illinois agriculture may attain its highest development.

There are two answers to the question, "Why is agriculture on a different basis than other professions"? The first is that the agriculture of the people is its attempt to feed itself from its own territory, and no other line of public or private effort is so fundamental to the existence of that people save only the repelling of invasion. This is one reason, and of itself a sufficient one, why a large share of public effort or money if you please—should be always directed to this problem of food supply, particularly as no people has yet learned how to feed itself for any great length of time upon the same land. They have been compelled, therefore, to move or starve, and in either case have lost their identity.

But there is another answer to the question, "Why should agriculture have peculiar attention at public expense"? It is this: Individual effort is found to be unable to develop agriculture to any great extent. A company can be organized with $100,000 stock or $1,000,000 stock and can make a box of shoes every minute of the 24 hours, and the output is cheapened as the business is heavily capitalized. A reaper, a mower or a piano can be made complete

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every five or ten minutes. It is simply a question of concentration; of business management; of organization; of capitalization. A man with a pick and a shovel cannot operate a mine; it must be capitalized.

In all these cases immense values are involved. The capital can be rapidly turned and returned. Almost any outlay for experiment will pay if only the margin is affected by the slightest fraction; $10,000, $100,000, is a small matter in a business running into the millions, particularly if it can stop enormous and persistent leaks; and experience has proved that all professions and all industries that can be capitalized can take care of themselves, and have not only taken care of themselves but have become singularly developed under private enterprise alone.

The effort has cost some fortunes. Companies have broken up, men have been ruined, families disappointed, but the business has all along progressed. The public is merciless if only a thing goes, and it can not do more for the individual than stop a moment and bind up his wounds when he is badly hurt. To this end charity exists.

But all efforts to capitalize agriculture have signally failed in two vital respects: First, it does not pay; and second, it is ruinous to land. It seems to be impossible to develop agriculture solely by private enterprise, as is the case in other industries. Like public education, it does not seem to prosper sufficiently when left to private effort alone. What though landed companies fail? What though farmers fail? Nobody cares for that in itself—any more than when the groceryman or the lawyer fails, except to say, "poor dogs," and to drop a tear on the grave.

But that is not the point. The point is that agricultural failure is not through that sort of competitton which is good for the business. It comes from something else that lies deeper. It can not be capitalized, and the higher laws of organic life and of soil fertility are so complex and so difficult to understand as to be beyond the efforts of the individual or even of one generation of men. This is why it is that public money should be put into the systematic study of agriculture. It is the most difficult of professions, as it is the most ancient and the most fundamental.

All the easy things have been learned in the six, seven or more thousand years since the first farmer commenced. The individual has done all he could. The final solutions are too much for him. He can take care of himself, but he has not learned how to take care of all the rest of us. Private enterprise has done its best and there yet remains much to be done. The final question is yet to be solved "How can Illinois sustain a civilization such as ours for a thousand years—for ten thousand?" To begin to answer that question and to make us all richer, better fed, and more comfortable in the meantime—that is the purpose and intent of such legislation as "Bill 315."

And who shall say it is not well expended? It is less than one cent for each six acres of Illinois lands. We spend hundreds of thousands of dollars to care for the unfortunate. That is charity. We spend millions to restrain the criminal and the insane. That is protection. Both are necessary, but both are a drain upon our energies, for they bring no returns and they will go on forever.

On the contrary, money put into education, into the development of the industries and the increase of the productive energies of normal people—all this is accumulative. There are returns immediate and everlasting.

Money put in the unproductive is at the best money sunk. It is either charity or necessity, and in either case, God bless it; but money put into the productive to make it more productive is an investment, and God will bless it more abundantly. The one is benevolence, the other is statesmanship.

The convention of delegates met as per the following call in the opera house promptly at 5:00 o'clock p. m. President W. R. Kimzey, chairman; A. B. Hostetter, secretary.

The delegates from the several County Farmers Institutes will meet at the above named time and place to elect directors of the Illinois Farmers Institute for the odd numbered congressional districts, and for directors to fill vacancies in the following even numbered districts, namely, the Second, Fourth, Sixth, Eighth, Tenth, Twelfth, Fourteenth and Twenty-fourth Congressional districts. Only duly accredited delegates present will be allowed to vote. Voting by proxy not admissible.

The committee on credentials of delegates reported as follows:

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the First to the Ninth Congressional districts, and find the following persons entitled to seats in this convention:

Melville K. Sweet, Glenwood.
F. C. Rossiter, Chicago.
Elmer Dalton, Dalton.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Tenth Congressional district, and find the following named persons entitled to seats in this convention:

H. D. Hughes, Antioch.
O. B. Whitmore, Gurnee.
Freeman Clow, Gray's Lake.
Mellville K. Sweet, Glenwood.
F. C. Rossiter, Chicago.
Elmer Dolton, Dolton.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

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ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Eleventh Congressional district, and find the following named persons entitled to seats in this convention:

J. H. Turner, Hebron.
T. A. O'Cock, Marengo.
H. C. Mead, West McHenry.
Frank Sprague, Lockport.
C. D. Bartlett, Wheaton.
H. D. Compton, Wheaton.
R. T. Morgan, Wheaton.
Joseph Newman.
Judd Mason.
J. L. Mason.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT.
D. H. SHANK.
H. D. HUGHES.
H. G. EASTERLY.
Committee.

ROCKFORD, ILL.. Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twelfth Congressional District, and find the following named persons entitled to seats in this convention:

Hon. David Hunter, Rockford.
George W. Collins, Rockford.
C. P. Coolidge, Winnebago.
B. S. Herbert, Belvidere.
Walter Lucas, Belvidere.
E. C. West, Sycamore.
Luther Lawrence, Belvidere.
A. C. Gabel, Yorkville.
Emmett Willmarth, Sycamore.
I. Vandleburg, Kingston.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Thirteenth Congressional District, and find the following named persons entitled to seats in this convention:

Read Russell, Warren.
John Dallyn, Galena.
F. B. Walker, Dakota.
William Hunt, Elroy.
Chas. Statz, Shannon.
Chas. T. King, Rochelle.
Chas. A. Wetherbee, Sterling.
William Peugh, Sterling.
R. R. Murphy, Garden Plain.
J. L. Hartwell, Dixon.
J. C. Howlitt, Paw Paw.
Collins Dysart, Nucham.
Willis Akins, Warren.
Frank Linn, Byron.
Chas. Walkup, Oregon.
J. W. Stocks, Elroy.
Mrs. Henry McKay, Mt. Carroll.
A. B. Hostetter, Mt. Carroll.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Fourteenth Congressional District, and find the following named persons entitled to seats in this convention:

L. B. Strager, Rock Island.
Euclid N. Cobb, Monmouth.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

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ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Fifteenth Congressional district, and find that the following named persons are entitled to seats in this convention:

C. P. Fingle, Canton.
S. N. Black, Clayton.
J. B. Frisby, Mendon.
W. W. Cole, Genoseo.
Chas. Malcom, Cambridge.
O. L. Fay, Oneida.
J. H. Coolidge, Galesburg.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Seventeenth Congressional district, and find the following named persons entitled to seats in this convention:

John Hughes, Pontiac.
Mrs. Chas. Yoder, Bloomington.
J. W. Jones, Lincoln.
J. T. Foster, Elkhart.
Mrs. Purviance, Elkhart.
W. B. Strand, Atlanta.
L. H. Kerrick, Bloomington.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHGS,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Nineteenth Congressional district, and find the following named persons entitled to seats in this convention:

E. L. Hoffman, Waynesville.
B. Burrows, Decatur.
C. A. Thrift, Decatur.
Chas. Adkins, Bement.
W. L. Rhodes, Bethany.
T. H. Crowder, Bethany.
J. C. Hoke, Sullivan.
E. E. Chester, Champaign.
W. C. Gamble, Arcola.
Isaac S. Raymond, Philo.
A. D. Shamel, Urbana.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 10, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twenty-first Congressional district, and find the following named persons entitled to seats in this convention:

Harry Grundy, Morrisonville.
Mrs. Harry Grundy, Morrisonville.
C. H. C. Anderson, Carlinville.
E. C. Richards, Hillsboro.
Arthur Ware, Butler.
Wm. A. Young, Butler.
W. B. Otwell, Carlinville.
Col. Chas. F. Mills, Springfield.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several candidates of the Twenty-third Congressional district, and find the following named persons entitled to seats in this convention:

Joseph Oldfield, Vandalia.
Chas. E. Cox, Vandalia.
Richard Whittle, Jr., Vandalia.
John D. Trimble, Trimble.
Fred C. Goodnow, Salem.
A. V. Schmerhorn, Kinmundy.
L. N. Beal, Mt. Vernon.
S. T. Maxey, Mt. Vernon.
Mrs. L. N. Beal, Mt. Vernon.
Lincoln Kell, Salem.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twenty-fourth Congressional district, and find that the following named persons are entitled to seats in this convention:

M. E. Shirtleff, Bone Gap.
John P. Stelle, Dahlgren.
W. J. Casper, New Burnside.
Israel Mills, Clay City.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twenty-fifth Congressional district, and find the following named persons entitled to seats in this convention:

Walter R. Kimzey, Tamaroa.
J. M. Vancil, Benton.
A. G. Crow, Murphysboro.
John T. Galbraith, Carbondale.
H. G. Easterly, Carbondale.

Respectfully submitted,

JOHN T. GALBRAITH,
A. W. BRYANT,
D. H. SHANK,
H. D. HUGHES,
H. G. EASTERLY,
Committee.

After the report of the committee on credentials the respective congressional districts met to select a director for the ensuing term, and reported as follows:

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the First Congressional district beg leave to report that they have selected Mr. C. P. Reynolds of Cook county, to act as director of the First Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Second Congressional district beg leave to report that they have selected Mr. B. R. Pierce of Cook county, to act as director of the Second Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Third Congressional district beg leave to report that they have selected Mr. Merrill K. Sweet of Cook county, to act as director of the Third Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Fourth Congressional district beg leave to report that they have selected Mr. W. Malcolm Wanly of Cook county, to act as director of the Fourth Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Sixth Congressional district beg leave to report that they have selected Mr. F. C. Rossiter of Cook county, to act as director of the Sixth Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Seventh Congressional district beg leave to report that they have selected Mr. James Frake of Cook county, to act as director of the Seventh Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER.

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Eighth Congressional district beg leave to report that they have selected Mr. John M. Clark of Cook county, to act as director of the Eighth Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Ninth Congressional district beg leave to report that they have selected Mr. Jacob F. Rehm of Cook county, to act as director of the Ninth Congressional district for the ensuing term.

Respectfully submitted,

F. C. ROSSITER,

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Tenth Congressional district beg leave to report that they have selected Mr. H. D. Hughes of Antioch, Lake county, to act as director of the Tenth Congressional district for the ensuing term.

Respectfully submitted,

O. B. WHITMORE,

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Eleventh Congressional district beg leave to report that they have selected Mr. Judson Mason of Elgin, Kane county, to act as director of the Eleventh Congressional district for the ensuing term.

Respectfully submitted,

FRANK SPRAGUE,

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates to the Twelfth Congressional district beg leave to report that they have selected Mr. B. F. Wyman, of Sycamore, DeKalb county, to act as director for the Twelfth Congressional district for the ensuing term.

Respectfully submitted,

DAVID SHUTEL,

President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Thirteenth Congressional district beg leave to report that they have selected Mr. A. F. Moor, of Polo, ——— county, to act as director for the Thirteenth Congressional district for the ensuing term.

Respectfully submitted,

READ RUSSELL,
President.

WM. HUNT,
Secretary.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Fourteenth Congressional district beg leave to report that they have selected Mr. E. N. Cobb, of Monmouth, Warren county, to act as director for the Fourteenth Congressional district for the ensuing term.

Respectfully submitted,

L. B. STRAYER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Fifteenth Congressional district beg leave to report that they have selected Mr. J. H. Coolidge, of Galesburg, Knox county, to act as director for the Fifteenth Congressional district for the ensuing term.

Respectfully submitted,

W. W. COLE,
President.

J. B. FRISBIE, JR.,
Secretary.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Seventeenth Congressional district beg leave to report that they have selected Mr. S. Noble King of McLean county to act as director for the Seventeenth Congressional district for the ensuing term.

Respectfully submitted,

J. W. JONES,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Nineteenth Congressional district beg leave to report that they have selected Mr. E. E. Chester of Champaign county, to act as director of the Nineteenth Congressional district for the ensuing term.

Respectfully submitted,

CHAS. ADKINS,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twenty-first Congressional district beg leave to report that they have selected Mr. Edward Grimes of Montgomery county, to act as director of the Twenty-first Congressional district for the ensuing term.

Respectfully submitted,

WM. A. YOUNG,
President.

C. H. C. ANDERSON,
Secretary.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twenty-third Congressional district beg leave to report that they have selected Fred. C. Goodnow of Marion county, to act as director of the Twenty-third Congressional district for the ensuing term.

Respectfully submitted,

A. V. SCHERMERHAN,
President.

F. C. GOODNOW,
Secretary.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twenty-fourth Congressional district beg leave to report that they have selected Mr. Israel Mills of Clay county, to act as director of the Twenty-fourth Congressional district for the ensuing term.

Respectfully submitted,

W. J. CASPER,
President.

ROCKFORD, ILL., Feb. 19, 1902.

To the Convention of Delegates of the Illihois Farmers' Institute:

The delegates of the Twenty-fifth Congressional district beg leave to report that they have selected Mr. H. G. Easterly of Jackson county, to act as director of the Twenty-fifth Congresssonal district for the ensuing term.

Respectfully submitted,

A. G. CROW,
President.

There being no further business the convention for the election of directors adjourned.

WALTER R. KIMZEY,
President

A. B. HOSTETTER,
Secretary.

WEDNESDAY EVENING, AT 7:30.

Vocal solo, "Song of the Dawn," Allitson; by Malcolm Halberg.

President: The program being devoted entirely to educational topics, it is especially appropriate that the State Superintendent, who is a member of the State Instiute Board, should preside over the meeting this evening. It is with great pleasure I introduce to you Hon. Alfred Bayliss.

LADIES AND GENTLEMEN—It is stated in the prospectus of this meeting that if the counties drained by the Rock river had been organized into one commonwealth, a state would have been formed in that way which could not be equalled anywhere else in the country. I presume it is within the limits of the simple truth to say that nowhere else in all the world within a like area are a larger portion of the people well fed, well clothed and well sheltered. It is probably true that nowhere else in this or any other country is there a more industrious, enterprising, progressive or patriotic citizenship. If the Rock river can be excelled in any way it must be either in Egypt or Fox river district, or central Illinois.

This being the case, the committee in charge of this meeting was very happy in its selection of the location. This being true, also there seems to be a certain propriety in doubling the allotment of time usually given to the most important of all the important interests of the farm, the common schools.

Any observer of the manifest progress in school matters must notice of late years two things which stand out in quite bold relief, more so than any two other things that could be easily named. One is the increased activity among county superintendents and teachers and children and school directors in improving the surroundings and the equipment of the farm schools or the one-room schools out in the country. No such activity has ever been known before in this State. That is one thing. The other is this: Heretofore the most of our educational activity has been taken in the direction of developing the power to say things, either by word of mouth or in writing. If we think of what we have been trying to do in the schools, it has besn confined almost entirely to the simple ability to master a book and then pronounce in words its contents. The thing we are now struggling to do is to find a way to add to our training the ability to express ones self by doing things as well as saying. Really the men who have made the world are the men who have done things. You can see this idea illustrated tomorrow afternoon at 5:00 o'clock in the Rockford High School. Now most of the parents who have two or three children going to school have had occasion at times they thought to kindly suggest to the teacher that to keep John or Mary after school to work overtime didn't exactly meet the requirements of the case in every instance. Not very long ago I saw a boy working overtime in the Rockford High School. He didn't have to. It was after 5:00 o'clock in the afternoon. He was working at a steam engine, the drawing for which he had made himself—every part of which he was undertaking to make himself. The entire task was supposed to occupy about two years' time and it seemed to me that when I observed that boy working overtime and voluntarily, that there must be something in the continuous exercise of hand and brain combined extended over a period of two years which is more beneficial than to spend the two years of time and effort under a sort of compulsion in the study of Cæsar's commentaries or Cicero's orations. I am inclined to think this is true.

We have made some progress that can be pointed out with the boys, quite a little, less with the girls, but here and there a school is actually engaged in the teaching of the girls to do as well as to say, and we have with us this evening a teacher from another state who is engaged in that sort of work.

I have great pleasure in introducing Miss Hostetter of Janesville, Wis., (it is not necessary to go out of the Rock river valley,) who will discuss "Domestic Economy in Schools."

DOMESTIC SCIENCE IN THE PUBLIC SCHOOLS.

By Miss Sarah Hostetter, Janesville, Wis

The subject assigned me is Domestic Science in the Public Schools. A more popular subject and one more worthy of attention could not have been selected. There are many experienced teachers ready to give their aid and attention to this important study, and it is with some hesitancy that I add my own experience hoping in a small way to help on a good cause.

Domestic science, domestic economy, domestic art, cooking and sewing are four ways of expressing scientifically and simply, in broad and particular sense, special phases of the same subject.

Domestic art, cooking and sewing, express simply the work we are trying to do in the public schools. Yet the two words cooking and sewing are not descriptive of the traditional drudgery; there is more in them than we have been in the habit of thinking. Health of body and mind depend upon the proper understanding and application of principles involved in their study.

Ruskin implies a world of meaning in answer to the question, "What does good cooking mean?" "It means the knowledge of Medea and of Circe, and of Calypse, and of Helen and of Rebekah and of Queen of Sheba. It means the knowledge of all herbs and fruits and flowers and of balms and spices, and of all that is healing and sweet in field and groves and savory in meats. It means carefulness and inventiveness and watchfulness and willingness and readiness of appliance. It means the economy of our great-grandmothers and the science of modern chemists. It means much tasting and no wasting. It means English thoroughness and French art and Arabian hospitality."

The terms domestic science and domestic art may be briefly defined in several ways. Science is classified knowledge; domestic belonging to the home. Domestic science is therefore classified knowledge of all that belongs to the home. Then the word art includes in its meaning the method of doing well some special thing; putting the two words together we have the method of doing well the things that belong to the home.

There surely is no broader subject or nobler art than home building; the happiness of the individual the success of the church, the State, the country depends upon the homes that are being made.

Where shall we begin to educate the home builders? and this question brings us at once into our subject of domestic art in the public schools. We admit that women need training to be good housekeepers; but where is the girl going to get this training? In a great many, in the majority of cases perhaps, as soon as she is out of school she will go into a store, schoolroom, in a few instances into some one's kitchen. She is busy from morning until night, while some one trained by hard experience prepares the meals and conducts the home affairs, often well, often poorly.

Then the young man comes along and the next step for the girl is matrimony. She may go to boarding; if she is brave and sensible she will much prefer her own little home. And now for a long series of experiments, worries, failures, tired days, heartaches and all sorts of aches. There are exceptions to this rule as to all rules; we must however admit the general state of affairs and prove the rule by the exception.

Educate a girl in every way; let her study art, music, the classics and science, what you will, but give her her first lessons in practical home affairs along with these. Train her head, heart and hands and begin while she is in school. Let her have her first impressions of the importance of cooking and sewing and the culture that may come with manual training when in the grammar school and then take it with her into the high school.

That there is much science in household matters we will not stop to consider. We must teach the girls that it is just as important, just as dignified and a thousand times more useful, to make a loaf of bread with an intelligent understanding of all the principles involved, as it is to spend hours at the piano, in the library, hunting old histories in the art room, at the club —anywhere away from the kitchen.

It is right and necessary, pleasant and refining to study all these things; but bring this culture into the home life and give home affairs an equal amount of study and practice.

In an age distinctly practical it is not necessary to try to prove the importance of useful training. It is admitted by all. The question arises when and how shall we acquire this training? One great trouble is the question of time—what we must leave out if life is too short for everything Already too much is crowded into our school courses of study, both in the grades and in the high school, and there is much in our boasted public school system that needs to be improved. The schools are full to overflowing and teachers overworked. This is one reason girls have no time to learn household duties at home, even if all mothers were good teachers. Girls often come to me and say, "Mother thinks I can learn cooking at home;" another, "I can cook at home, but have no time to sew there;" then another, "I have six studies; I must omit cooking and sewing"—of course she must and she omits the wrong thing.

It is a sorrowful thing that some of the most serious objections to the domestic art course are presented by mothers, often by teachers. They willingly spend hours upon child study and psychology and are rashly indifferent to the subjects of food, hygiene, etc., forgetting—worse, ignoring—the fact that the child's moral and physical development depends upon the food he eats and the sanitary condition of the house he lives in.

A true story says, a little girl came to school every Monday morning all out of sorts, was idle, cross, mischievous, the trial of the teacher and nuisance in class and play room; the teacher in despair visited the mother, and it was found that on that special morning the child's breakfast was buckwheat cakes and coffee. "Dame Nature" had a right to express herself abused; under a change of diet the trouble was overcome.

Then school boards consider the expense of manual training both for boys and girls. We study and teach economy and frugality in our domestic art courses, and certainly appreciate and respect their objections. But after all the amount expended is not great, especially when the value received is so important. In Chicago cooking schools, connected with the public schools, the estimated price per pupil is 1½ cents; my own experience the past fall term was 1¾ cents a lesson per pupil, two or three lessons a week depending upon the class. The expense of putting in an equipment varies from one hundred to five hundred dollars or more, as circumstances dictate.

In Janesville during the winter term we have broadened our work and have taken the girls from the eighth grade in the city schools into the cooking classes. There are many reasons and good ones for putting the work into the lower grades; a large per cent of the pupils never reach the high schools; Dr. John Dewey says 5 per cent. The work may be done by the regular teacher or a special; time and experience will develop the best way of handling the subject.

Manual training for boys, cooking and sewing for girls in the public schools has come to stay and will soon be considered as a matter of course as it is in some of the best schools in the world in Sweden and Germany.

The past few years we have been trying an experiment and turning the practical side of our work to account in noonday lunches for the pupils.

For a long time men have known how to feed animals scientifically in order to develop the finest specimens, even improving dispositions by application of certain food principles. Nature responds to this regard for one of her important laws; a queen bee is grown from an ordinary cell, fed royal food; flowers and fruits respond to the touch of scientific cultivation. But a child, it is only within a few years that food and mental and moral development have been associated. Instinct teaches the bee wisdom and what treatment is needed to make a queen. Reasonable and intelligent man eats the thing that habit and taste suggest.

Class in Domestic Science preparing lunch for Janesville High School.

"Diet makes the man;" how much more important that the growing boy or girl should have the food suited to their developing bodies. There is a bake shop near by, the girls spends all her pennies for a sweet morsel; how about the boy? the stimulant and the cigar. Hunger is a good guide, but it also leads into all sorts of experiments and temptations if guided by ignorance.

Atwater, though teaching a dangerous sentiment, is right when he says that alcohol is a food, and just here is one of the strongest arguments in favor of cooking schools and noon-day lunches. Something must take the place that should be filled by suitable food, for a poor meal is easily supplemented by the glass of beer. People who know and study statistics say that more is being done for the temperance cause in the cooking schools than anywhere else.

The practical demonstration of a theory must prove its soundness and I am going to give in detail a little that is being done in a cooking school. It is scientifically established that the body requires a certain amount of proteid, nitrogenous food in a day, three ounces; 12 ounces of sugar and starch, three and one-half ounces of fat, one ounce of mineral and about four pints of water; this is an average amount for a person engaged in moderate labor. Of course we can not weigh and measure every proportion, but the aim is to give a good wholesome lunch suited to the needs and appetite of the average boy and girl.

The cooking classes prepare the food and each girl takes her turn once a week in serving. There are generally three courses, always soup of some kind, and just here is a lesson in learning to like soup and a good variety to be cooked; sandwiches of fruit, nuts, cheese, etc., follow the soup course, generally a light dessert finishes the meal.

Cocoa, if desired, and occasionally a meat course for variety and desired proteid. Eggs, of course, are too expensive, and the milk is in the cream, soups and cocoa.

The charge for the lunch is 10 cents, and during the cold weather the average number of pupils taking lunch has been 60. Tee department supports itself. If those who bring a cold dinner wish it there is soup for 2 cents, chocolate 3 cents, served by a girl in her neat cap and aporn. "The proof of the pudding is in the eating," and the girls watch the plates to see how their cooking has been appreciated.

Then the important feature of doing something for some one else and of making a dish large enough for a meal, the dignity and usefulness is worth while, and the object and aim of all training is development, and self control comes with doing and the acceptance of responsibility.

The girls learn lessons in economy and the proper use of plain food materials; prices are estimated and food values counted. Too be sure there are many objections to serving these lunches by the classes, principally because it takes so much time. It surely does take time and is hard work for the teacher, but it is also an educator from several standpoints.

Serving lunch Janesville, Wis., High School by members of class in Domestic Science.

There is no successful labor that does not involve sacrifice, and little by little with unlimited patience must these problems be solved. Begin with the girls we must, for women are conservative and old experienced cooks are slow to accept innovations of all kinds. Our agricultural schools are training young men for farmers, but where are the young women who are willing and capable of being farmers' wives? Not as many girls take the training as boys. There is a lack of respect and appreciation of the dignity and science in domestic affairs among women themselves, and girls by long habit are educated to feel that there is more respect shown for a clerk, dressmaker or school teacher than for a girl in the kitchen. I must admit that there is, and just here women are to blame for the condition of domestic service. They must honor and appreciate the home science if they expect girls to do it. The cooking and sewing in schools may not wholly solve the problem of domestic service, but it is a step in the right direction, and we need the coöperation of every woman and man.

The girls like the work in school and it is a rest and change from other class work. Even the dullest girl takes pleasure in her cooking and sewing; just the other day a girl said to me, "I like the shirt waist I made better than any I ever wore," she enjoyed the satisfaction of having made it herself, drafting the pattern and all. Often I hear, "I tried the recipe at home and every one liked it." These are only a few of the things that give the teacher courage to go on.

Many of the principles involved in the study of foods could be taught in connection with other studies. Geography and the food products of each country. Physiology and science of digestion and uses of foods in the body. Chemistry and the composition of foods. Arithmetic and values of materials, there are many and some of them should not be separated. These things should be and could easily be taught in the country schools, and without expense if the teacher were prepared, the sewing could be put in every school if only one afternoon a week.

Such lessons learned in class and then the practical application made in the kitchen and sewing room, the subject becomes one of unending interest.

Every person should make it a duty to know something of the uses of food in health and sickness. "Plain living and high thinking" some one says, "is today only theoretical," a statement handed down from the "May Flower."

I would like to preach the doctrine of frugality in every home in the land, not only of food but of time and strength. There is so much to be done in this world, so much to study and read, so many clubs, such a great big, busy place, the home, the center of all suffers.

Women, and men to, do not stop to consider how important or serious the study may be made, or how useful, not only from the practical but the theoretical and educational sides of the subject.

Mrs. Richards says, "I believe that the duty that lies next is the instruction of all the people, in food values, and the inculation of respect for the body, and the office of food as a means to an end, and that end the highest duty of man."

Vocal Solo "WhenThou Art Near," Lohr, by George Nelson Holt.

The Chairman:—The unit of organization of the school system of Illinois is the Township. The unit of taxation for school mantenance unfortunately is the school district, but the real unit of work, the force which makes things move especially in all things that relate to the country is the county, and the school of the good county will be progressive and doing better year after year according as the County Superintendent is good. This county of Winnebago has been fortunate for a number of years it is selecting for the important work of the county superintendent men of quite unusual knowledge. Men to whom it seems to be natural to strike out into new paths.

The predecessor of the present incumbent Mr' Kennie had a flag on the flag pole attached to every school house in this county some years before the Legislature every thought of such a thing as enacted a Flag Law. I mention this simple as an instance.

The present County Superintendent of Winnebago County is a young man just entering upon the last quarter of his first term. He is a new man in the sense of that business, but a new man who took hold of his work the first day for all the world as though he had worked at it all his life and didn't know how to do any thing else. When it came to his knowledge that about two thirds of the schools of Illinois were without libraries it accurrs to him that Winnebago County should not remain in the ranks of the majority very much longer. To day out of the 12,852 schools in this state, I should have said last July for the figures are different today, 6,422 had a little collection of books for the children to read, 6,430 remained without such a collection the first of July. The figures have been very materially changed since that date and I think when the next count is made it will appear two schools have libraries for everyone without. I simply want to cite Mr. Kern's way of getting at this library work as an example. It occurred to him last summer at the time of graduation of the young people from the eighth grade that it would be a good plan to have five or six in all instead of bringing them all to the County seat and having practically no one present but the children as so often happens, and in carrying out his plans for these graduations it occurred to him to permit the people who came to pay ten or fifteen cents at the door and the permission was made use of to such an extent that when all expenses had been paid Mr. Kern found himself with a balance of $300 to the credit of his library fund which was not more than half bad. It seemed to him, however, that it was not more than half good and so he went to the Board of Supervisors of Winnebago County with the $300 in one hand and the other emply and suggest the balance could be maintained better if they would put $300 in the other hand. Winnebago County has a very remarkable Board of Supervisors and Mr. Kern found himself with $600 to the credit of his library fund. With that he has been able to duplicate one of the cases of the traveling libraries of this association forty times. That $600 lacks $125 of being one fourth of the sum appropriated by the General Assembly for the entire State of Illinois. That is Superintendent Kern and the Winnebago County Board of Supervisors are able to do one fourth as much as the whole State of Illinois does in that direction. I mention this because I think it ought to be mentioned. That little scheme is worth general circulation. You don't know ladies and gentlemen, you can't know unless you have given your attention to it how much this means. You don't know how hungry, you who have plenty to read, these teachers and school children are for something in this direction.

You remember seeing in the papers the account of the little girls in Coles county that wanted a library. They had no other way to get it and the little teacher of that school took Saturday and with eight girls in each school they borrowed a wagon and a team and the sideboards for the wagon and the eight girls and the teacher went out into the country and the first farm they came to they drove in and said to the farmer: "Will you give us five bushels of corn if we will husk it ourselves?" and the farmer said: "Huh", and the girls said: "Will you give us five bushels if we husk it ourselves?" and he said: "Take all you want" and the next farmer said take all you want and the next and by and by the wagon was full and the girls drove back to town, and mixed corn this year, judiciously mixed was worth 3½ cents above the market price in that town and the girls had $20 for the books and they were pleased over their Saturday holiday.

Delegate: That school is in Moultrie county.

I have never been quite able to locate that school. It is on the line between Moultrie and Coles and both counties claim it.

The last letter I read before coming, came from a county superintendent of Grundy county and womanlike she had put a postscript and said I think you will be interested to know we had a basket social in such a district the other evening and the next result was $90.14. What do you think of that? It is going on all over the State. They do all this because they want the books.

One of the best things the institute is doing is taking an interest in the country school. It is time something is being done when the county superintendent of Winnebago county heard there were only 2,802 school houses in Illinois that were classed as well-kept, out of over 12,000, only 2,802 that the county superintendents will certify to as well-kept—there is still 2,346 little school houses standing in Illinois out on the prairie without so much as a tree or shrub—the county superintendent of Winnebago county said I will diminish one of these numbers and I will increase the other and the way he has set about it will interest you when you hear about it tomorrow evening. Out of the 12,000 the county superintendents say 8,303 are suitable for the purpose intended, comfortable and well-kept, and they certify that 1,287 school houses in the State of Illinois are in the condition I should mark "I. C." The boys know what I. C. means, the others do not. Inspected and condemned 1,287. The county superintendents admit and there is not a county superintendent who will admit a single undesirable thing if he can help it. Now that condition is being remedied in this county in a way you will hear more about tomorrow evening.

We are improving the school houses at an incredibly rapid rate in an expensive way. All the county superintendents are doing it except one does it one way and one another. If you have a county superintendent that is not attending to these things mark him "I. C."

No way has yet been found and patented by which a school can be organized and maintained without children, the best judges believe. They believe an essential condition of the school is a certain number of children 20 to 30 to make a good school. Now there are nearly 1,965 schools of this State carried on for fewer than 15 children, 423 with ten and nearly 100 for fewer than five children. This condition of things presents a problem. In the study of this problem the county superintendent of Winnebago county has been a pioneer. He began the careful and systematic study of this problem before anyone else in Illinois and came to the same conclusion which he desired to verify by actual contact with the facts in the case. This excellent board of supervisors which stands behind him so nobly has a committee which has a chairman who is a very conservative man, who believed at one time and spoke as a good many others have believed that certain things could not be done because they extended beyond the limit of the ability to pay for them. So when it was decided to send Mr. Kern to Ohio so that he might come in contact with the work the conservative member went with him and I went along with the two and together we visited schools in three different counties in a good many townships and when the chairman was satisfied we left Mr. Kern making a more thorough investigation. We had to make up a little purse so that he could stay as long as he wanted to. His ideas will be based on what he saw and what he thinks about it, together with some new information that has come to him lately, and I am very proud to introduce the county superintendent of Winnebago county, Mr. O. J. Kern.

CENTRALIZATION OF COUNTRY SCHOOLS.

By O. J. Kern, Supt. of Schools, Winnebago county, Ill.

Mr. Chairman, Members of the Institute, Ladies and Gentlemen:

It is, indeed, a high privilege to be permitted to address the members of the State Farmers' Institute of such a great commonwealth as Illinois. It is a sincere pleasure for me to attempt to interest you in a subject which is the basal factor of all movements for the improvement of country life and conditions, viz: The evolution of the country school. In a recent editorial on Higher Education and Commercial Life in the Railway Age, this significant statement is made, that "the fact is not to be doubted that educational standards and educational requirements for success are growing higher every year in the United States, and therefore, it seems more than probable that the man with the best education of the true sort, will be the winning man of the future. "Better educational facilities must precede all efforts to make permanent the advanced methods in agriculture. The establishment of an agricultural college in connection with the state university is an acknowledgement of the fact that the farmer, the successful farmer of the twentieth century must be an educated one.

But why limit our efforts to build up a great institution practically beyond the reach of the great majority of the country children of Illinois? The reorganization and improvement of the country school should receive the most earnest attention of the American farmer of today. For it is here that 90 per cent, at least, of the country children get their only education as far as books are concerned. Such a training for life's duties, if training it may be called, as may be acquired in an unsanitary building and premises, about the worst in the heighborhood, a short school year, total absence of library and proper apparatus for school work and the children in charge of a young, underpaid and untrained teacher.

PICTURE NOT OVERDRAWN.

The picture is not overdrawn. The facts may be verified if country people will only visit their schools and inform themselves of the conditions under which the children and teachers are compelled to work. My observation is that, as a rule, patrons of the district school do not do this though they are quick to criticise if the right results are not forthcoming. Parents are responsible in many respects. The best of teachers are handicapped in an uncomfortable, poorly ventilated school room without maps, globe, dictionery, a small reference library and the irregular attendance of pupils because of weather or indifference of parents.

FACTS FROM STATE SUPERINTENDENT BAYLISS'S REPORT.

The last report of our State superintendent shows that the average number of days a country child attends school during the year is 89 as against 143 for the child of the cities and towns. That while 47 per cent of all the teachers employed in the State are in the country schools they did only 26 per cent of the work. For the days attendance at school is the unit of work on which comparative estimates can be made. Also that the country teachers, 47 per cent of all, worked 38 per cent of the time, taught 36 per cent of the children of the State and received only 24 per cent of the money expended for education. Again, of the 12,809 school houses in Illinois there are 1,278 unsanitary and unfit buildings for school purposes. County superintendents claim only 1,794 perfectly comfortable houses. There are over 2,000 school premises without a tree and about 5,000 schools without a library.

WRONG IDEA OF CONDITIONS.

To often we base our high conception of educational conditions on some magazine article describing an ideal or on the words of some orator as he pictures the blessings of our free public school system. All credit to the good work of the district school of the past and welcome be its future usefulness. I am not pleading for the 10 per cent of the children of the district schools, who, in spite of the district school perhaps, will make a success of life, but I am pleading for the 90 per cent of the children who can not or do not get any other education than that acquired under existing conditions. We are in the midst of an industrial evolution and farmers are quick to take advantage of every mechanical invention to decrease the cost of production, lessen labor and secure quick returns for their toil. In this age of quick transportation and communication no farmer dreams of returning to the reap-hook or the ox cart for the reason his father used them. And the refusal to take advantage of or even consider improvement in country school education must rest on sounder arguments than customs of the fathers, prejudice or political expediency.

PROBLEM OF THE COUNTRY SCHOOL.

The problem of the country school is a far reaching one. If the instruction and training of the average district school are all that could be desired why are so many farmers moving to the city to educate their children? Or why are they anxious for quick transportation in the way of electric roads so their children may attend the city school and return home every afternoon for the benefit of home influences? Again, many others would take advantage of the city school if they were financially able or cared to risk their children alone in a distant city. Many children now drive several miles to secure better educational advantages than the home school affords. And when farmers move to the city to educate their children do they as a rule move back to the farm? Rather they remain in the city, the farm in the hands of a tenant and the absent owner's interest in the district school becomes one of low taxation for school purposes with the resultant shortening of the school year and the cheapening of instruction. The fact is that the country child has as much right to the best educational facilities as has the city child. There should be no discrimination between the two in this respect. Their interests are idendical when it comes to preparation for the duties of intelligent citizenship. It is not desirable to attempt to keep all on the farm. It is imperative, perhaps, that a certain per cent of the fresh blood of the country flow into the stream of city life and quicken its wasted energies.

MOVEMENT TOWARDS THE CENTERS OF POPULATION.

But is this movement towards the cities a temporary one? Is there a tendency to desert the country? The Federal census of 1900 for Winnebago county shows that ten of the 16 townships, or civil towns more properly speaking, actually decreased in population over the census of 1890. And that four other towns, each with a village, are practically at a stand-still, one having increased only 29, a second 33, a third 62, and the fourth 69. On the contrary the city of Rockford in ten years has increased from 23,584 to 31,051. And if we add to the latter figures the population of the suburbs not included in the Federal census the total will show an increase of 10,000 for Rockford in ten years. And Rockford is only one of hundreds of similar instances in the country at large.

NEW CONDITIONS.

The city of Rockford is soon to be the center of a net-work of electric roads extending in all directions. Will the result be that all farmers living within a half a mile of such roads will pay transportation charges and tuition to have their children educated in the city? And if 20 per cent of the farmers can do this what kind of education will the children of the remaining 80 per cent get? The district school will be smaller than it is now with a consequent decrease in interest and vigor. The material equipment of the district school will be worse than it is now, and the cheapest teacher will be hired, for naturally the farmer who pays transportation and tuition charges to educate his children in the distant city will exert his influence for the lowest possible local taxation fot school purposes. And the most powerful factor in opposing this tendency is to utilize electric roads and other means of transportation to bring the country children towether in a centralize school. Thus a country graded school will be built up which will furnish the country child the same opportunities for higher education as are now presented to the city child.

THE SMALL SCHOOL.

In the district school of ten pupils or fewer, of ages from 6 to 15 years, for not many for obvious reasons remain after that age, with children of all degrees of advancement, it is impossible to classify to the best advantage. The pupil just learning to read can not be put in the same class with the one in the first reader. The boy beginning numbers cannot recite with the boy in percentage; The classes consist of one, or two, or possibly three pupils each. There is no great interest or enthusiasm in a recitation where the class consists of only one pupil. The number of recitations daily is from 21 to 35. With such a crowded program, the time of the average recitation is about ten minutes. This is not time enough for the teacher to probe to the bottom of the pupil's preparation, much less enable the teacher to instruct the pupil in the art of study. And the great irregularity in attendance on the part of the pupils increases the difficuly of the teacher to maintain a classification and have the pupils complete a satisfactory grade of work. On the plea of economy the directors usually want a cheap teacher for the small school. However enthusiastic the teacher may be in her work, the same energy by skillful direction will give far greater results. The young man may be untiring in his efforts to have his patient recover, but the law requires him to spend several years in study before the human body is placed in his charge for treatment. But no training is required of the person who instructs the children of the country schools. The patrons of the district schools hold out little inducement to teachers who have acquired a normal training. They are expected to teach for $20 to $30 per month, do their own janitor work, walk to school over all kinds of roads in all kinds of weather, and teach in a building totally unfit for educational purposes. Under such conditions, if a normal-trained teacher should find her way into the district school and attempt better methods of work and make a plea for better surroundings, she would be criticised by the patrons without visiting the school and quite likely there would be a change of teachers at the end of the term. Some districts now have three different teachers in a school year of eight months. There can be but little satisfactory work under such conditions.

DISTRICT SCHOOL OF THE PAST.

It is true that eminent scholars, statesmen and professional men have come from the district school of the past. The schools were larger then. The pupils were older, many of them, and there was interest, there was enthusiasm, and there was that rivalry that called forth all the powers of the student. The teacher was a man or woman of more mature thought and force of character, a student, ofttimes, teaching to earn money with which to finish his college course. Then there were not so many graduates of the graded schools with whom the country young man or young woman must enter in competition. In 1850, for all the United States 80 per cent of the schools were ungraded, and only 12½ per cent of the people lived in cities. Today 70 per cent of the people of Winnebago county live in the city of Rockford, leaving only 30 per cent for the remainder of the county; and a goodly portion of that 30 per cent live in the six villages having graded schools, thus leaving but a small per cent of the whole to represent the truly country population.

THE FUTURE.

This is a new age and the future will be characterized by fierce competition in which technical skill and a high degree of training will be necessary qualifications for success. Industrial organization never dreamed of will yet be attained. The farmer is beginning to learn that he must know something of the scientific basis upon which success in farming depends. He must be a thinker along the economic lines likely to be affected by legislation. The farm is beginning to feel the competition of the times, and better educational facilities must be offered to the great majority of the country children so that they may be able to meet the new conditions.

WHAT IS CENTRALIZATION OF SCHOOLS?

Centralization of schools does not necessarily mean that all the schools of a township must be combined into one school located at the geographical center of the township. There may be a union of three or four districts, making a two-room school, and there may be two of such schools in a township. Also small schools may be centralized with an established graded school where conditions are favorable. Complete centralization means the union of all the schools of the township into a central graded school. There may be consolidation of schools of two or more townships, just as there are now union districts.

TRANSPORTATION OF PUPILS IN VARIOUS STATES.

Eighteen states now have legislation permitting the transportation of pupils at public expense, viz.: Connecticut, Florida, Indiana, Iowa, Kansas, Maine, Massachusetts, Nebraska, New Hampshire, New York, North Dakota, Ohio, Pennsylvania, Rhode Island, South Dakota, Vermont, and Wisconsin.

There is abundant evidence in the reports of the various states to show the practicability, desirability and growing popularity of centralization of pupils at public expense. Time will permit a brief notice only of centralized schools of northeastern Ohio from a personal inspection in company with Superintendent Bayliss and Mr. John Black, chairman of the committee on education of the Winnebago county board of supervisors. We visited those schools in October, 1900.

OHIO VISIT.

Our visit extended through the counties of Lake, Ashtabula and Trumbull, some of the finest portions of the Western Reserve. It is not my desire to go into a detailed account of the centralized schools of those counties. Here are some printed pamphlets on this table showing pictures of wagons, transportation routes, etc., with facts and figures showing how the country school problem is being solved there. It is my earnest wish that delegates take this literature home with them, read it and pass it along. I wish especially to give some facts and illustrations received during the last two or three months. Besides, County Superintendent Bright visited those same schools in November last and he will have something of interest for you tomorrow evening with his lantern.

TOWNSHIP SYSTEM IN OHIO.

The township is the unit in Ohio for school purposes and is managed by a township board of nine to 14 members made up from one director from each sub-district of the township. They have no county superintendent of schools but instead a township superintendent elected by the township board.

ORIGIN OF CENTRALIZATION IN OHIO.

Centralization of schools in Ohio began at Kingsville, 1892, by special act of the legislature. This school we visited and the last report issued July, 1901, shows that the question was submitted to the people at the town election in April last and centralization carried by a majority of nearly six to one after a five years' trial of the plan. Since the special act for Kingsville a general law has been enacted so that the people may vote on the question at any regular or special election.

MADISON TOWNSHIP.

Madison township, Lake county, presents an excellent illustration of what may be called partial centralization, that is, a grouping of two, three or four schools into one without attempting to bring all of the schools of the township to the geographical center of the township. This would not be practical because of the shape of Madison township. It is one of the townships along the shore of Lake Erie and is nine miles long and five miles wide. Most of the townships of the western reserve are five miles square, while in other portions of the state where centralization is proving a success the townships are larger than those of Illinois.

Centralization has been in successful operation in Madison township since 1895. We visited the schools of Unionville and North Madison. At North Madison an old store had been placed in front of a school house and a three room graded school was the result. Here three wagons were employed in transportation. At Unionville two school houses were placed together and thus a two-room graded school was the result.

Superintendent J. R. Adams, principal of the Unionville school and superintendent of Madison township very recently sent me the following from his last report for the year ending June 30, 1901.

1. They now have only three one-teacher schools in the township.

2. Since centralizing the per cent of the enrollment of children on the census enumeration, census returns of school age between 6 and 21, has increased from 60 per cent in 1894 to 86 per cent in 1901.

3. For the year ending June 30, 1901 20 pupils were taking high school studies. This is more than can be said of many Illinois townships.

4. The total cost for the township for educational purposes in 1896 was $7,555; for 1901 $7,243.

5. Cost of transportation in 1896 was $332; for 1901, $1,618.

6. Incidental expenses for the township in 1896 were $2,509; for 1901 the incidentals were only $902.

7. Per capita cost for education for the township based on the total enrollment for 1896 was $19.36; for 1901 it was $17.50.

Superintendent Adams under date of Dec. 23, 1901, wrote me as follows: "The plan of consolidation of schools and the transportation of pupils continues to be very popular with our people. In no case would they go back to the old plan. Our wagons are being fitted with oil-stoves which makes them very comfortable for the children. We are now considering whether it would be advisable for the township to own the conveyances and simply hire the teams and drivers. It seems to me that by so doing we could get just as good service and at less expense. There are many men who have teams and would like the work but who do not wish to go to the expense of fitting a a suitable wagon, hence they will not bid for the work. There seems to be a tendency on the part of some who own school-wagons to advance the price each year thinking that those who have no suitable wagon will put in bids. This has resulted in increasing our expenses for transportation somewhat. I believe if the board of education owned wagons a reasonable price could be established and maintained."

There is nothing startling in the proposition for the township to own the wagons. Today many business firms own wagons and simply hire teams and drivers while great packing firms own their freight cars and hire motive power on the railroads.

TRUMBULL COUNTY.

Our visit to Gustavus and Green townships in Trumbull county is fully described in this printed pamphlet. Here we found complete abandonment of the district schools and the union of all the schools in one building located at the geographical center of the township. Nine wagons at an average cost of $1.25 per day are employed to collect all of the children of the township and take them to the central building. The longest route is four and three-fourths miles.

The schools at Gustavus were centralized in 1898 when a four room frame building was erected at a cost of $3,500. The schools at Green were centralized in 1900 and a $6,000 brick building was erected, the people of Green being so well pleased with the experiment in the neighboring township of Gustavus. Here is successful centralization of country schools in a truly country community six miles from one railroad and nine miles from another. So fully are these schools described in the printed report that I shall dwell no longer on them here. The illustrations speak for themselves. A letter from Supt. Harshman of Gustavus township of Dec. 17, 1901, states that four other townships of Trumbull county and one of Ashtabula county have recently voted to centralize.

ADVANTAGES OF CENTRALIZATION OF SCHOOLS.

1. There will result that inspiration and interest which always comes from numbers. A school of eight or ten pupils is not calculated to stimulate a boy or girl to do the best work possible. With only one in a class there is no competition, that rivalry which calls forth all the powers of the child, that preparation for the real struggle of life.

2. Stronger classes can be formed thus giving the teacher more time for recitation and the necessary instruction. There will be uniformity of text books thus securing unity of study.

3. It will result in greater economy of school buildings and equipment. It will cost less to keep up one central building than eight or ten scattered buildings. The children will have the educational influence of a modern, sanitary, well-ventilated, well-lighted, well-heated building instead of present conditions. The first cost of such a building is not as great as the first cost of the district school buildings of a township and it is only a question of time when the district school houses will have to be rebuilt. Some have stood for over 40 years already.

4. Trained teachers the product of our Normal schools will be found teaching the children of the country schools. There will be fewer teachers but better ones and better salaries will enable them to give better service.

5. A strong central library can be built up in the central school the books of which can circulate throughout the township as the children go back and forth in the wagons. Thus the best books can be brought within the reach of every child of the township. As a prominent magazine said recently: "Every child has an inalienable right to be brought into contact with the best writings of the world at as early period as possible; he has an inalienable right to the education in ideas, in feelings and in taste which familiarity with the best brings. * * * No one thinks of beginning a child's artistic taste by showing him inferior pictures. Reproductions may be shown to him because they are accessible, but he is brought face to face in every form with the best works of the best painters. No one thinks of educating a child's ear musically by giving him street tunes, vaudeville airs and "coon" songs; he is given the best from the start. In art there is no second best. The same rule ought to hold in regard to books. From the beginning the child ought to know the best and only the best." And the report of the State superintendent shows that 5,000 school districts in Illinois totally disregard this sacred right of the children to the companionship of the best books.

6. The school year for the country child will be lengthened. There will be more regular attendance and less tardiness. The average daily attendance will be increased and the ratio, as it now is, of 89 days for the country child to 143 for the city child will disappear. More children will be found getting the benefit of money expended for education in the township and thus the per capita cost will be decreased.

7. Centralization will quicken the social life of the community. In a centrally located school house there should be one large assembly room where the people may meet to see the work of the school or listen to lectures or musical entertainments. The isolation of the life in the country is repression for the young. The city furnishes attractions with its amusements and possibilities for culture in art and music.

8. By centralization of schools opportunities for higher education will be brought to every country child without additional cost. The high school course for the country school must be different from that for the city child. The environment is very different in each case. Consolidation of schools will

permit a practical tendency to the instruction for the country children. The city has the advantage in the way of schools. Its high school is in touch with the grades below and the college and university above. The connecting link between the farm and the agricultural college and the country school and the university is the centralized school with a strong two year's course for the high school room. There should be added to the course that which will stimulate the farmer boy and give him a higher conception of the dignity and importance of his calling. Surely his education should not be of such a character as will make him dissatisfied with the farm.

EX-GOVERNOR HOARD QUOTED.

Ex-Governor Hoard of Wisconsin says: "I know of nothing in the curriculum of the average district school that tends in any way whatever to encourage a farmer's boy to be a farmer. On the contrary very much that is taught therein rather leads him to believe that there is not sufficient scope for his intellect and ambition in agriculture. I would have our country schools in particular teach agricultural chemistry. I would have them teach the scholars the meaning of those terms which are now so generally used in the discussion of agricultural questions. It would have been worth much to me had I been taught at an early age the meaning of carbo-hydrates, protein compounds, phosphoric acid, potash, etc., and the relation of these subjects to the business of every day life."

SCHOOLS OF THE FUTURE.

A centralized school which affords time and opportunity for systematic instruction in elementary science throughout the grades under trained teachers for these schools and working in cooperation with the state college of agriculture will be able to meet the demand for instruction in things relating to the farm. There can be taught something with reference to feeding standards and selection of stock, fruit growing constituents of plants, rotation of crops, and composition and care of the soil. The centralized school may become, in effect, an experiment station working under the direction of the most expert instructors of the State college of agriculture. As a principal of a great city normal school said to me: "The centralized schools will become the best schools in the country, for there, in contact with nature, will be found freedom."

THE TRANSPORTATION QUESTION.

Arguments may be multiplied in favor of consolidation and most people will readily give their assent, but some object on the ground of transportation of children. All kinds of evils are imagined which in their minds settles the question in the negative for all time to come. Well, in northern Illinois the people are demonstrating the possibility of getting a load of milk to a central creamery in all kinds of weather and over all kinds of roads. Ought not a child's welfare be of as much solicitude as a can of milk? Transportation guards the health of the children, increases the attendance, keeps the big boys in school and makes possible the best education for all the children. The average daily attendance is increased and from 25 to 30 per cent more schooling is secured for the township at a decrease in the cost per capita. In Ohio boards of education exercise as much care in the selection of drivers as they do in the selection of teachers for the schools. The wagons must be comfortable for all kinds of weather, and oil stoves in addition to lap robes are provided for the comfort of the children. The drivers are under bonds for the faithful performance of their duties and contracts for the transportation of pupils are let to the lowest responsible bidder. And if, in the evolution of the transportation question the township owns the wagons and thereby decreases the cost as they are now contemplating in Ohio, it is only another illustration of the possibilities of progress in the twentieth century. We have not yet reached the limit in transportation facilities.

In conclusion, Illinois should be in line with the 18 other states of the Union in the matter of school legislation permitting the country people to improve their school facilities. All that is asked is permissive legislation, permitting the people of any locality to consolidate districts and transport the children at public expense. Such a bill drawn so broad and liberal that it could not be put in operation except in localities where the sentiment was almost unanimous for centralization was prepared by the State Department of Public Instruction for the last General Assembly. It passed the House but died in the Senate Committee on Education.

Influences from localities in no way affected by the bill secured its burial during the closing sessions of the legislature. Why should the people of Rockford object to legal permission being given to the people of any township in Winnebago county or in any other county in the State to improve their schools so long as it does not cost the people of Rockford anything for the improvement? Why should the people of Chicago, Peoria or Bloomington, or any other city, object to the State legislature giving to the farmers of any locality legal permission to solve the country school problem as it is now being solved in a dozen different states? Indeed, it is just as important to the city's welfare that good schools surround it and strong characters come from them into the city's life as it is that good farms surround it from which the best products are offered in the city's markets.

I can not believe that the country people are indifferent to the solution of the country school problem. If farmers will be convinced of law-makers legal permission to give to the children of those "living in the fields" as good educational facilities as are now enjoyed by the children of those "living by the asphalt," then we may expect legislation.

I do not believe this question is settled, as Mr. Abbott, member of the House Committee on Education of the last General Assembly said in a recent magazine article: "If the defeat of the above bill records the sentiment of the people then the question of centralization of country schools is settled in the negative for some time to come. If, however, it is not the sentiment of the people then the question is not settled and never will be settled until settled right."

The discussion of this subject will be opened by Mr. O. E. Bradfute of Cedarville, Ohio.

MR. PRESIDENT, LADIES AND GENTLEMEN—I hardly know why I should be asked to enter into the opening of this discussion except that it might be that the gentleman who has just preceded me may feel that when he was over in Ohio we misled him somewhat and I think I was probably invited on the program simply to tell you that what he has said concerning the matter in Ohio is every word true. You know sometime when people get away from town they might possibly be misled and I think they wanted me to verify what the gentleman has said with reference to the centralized problem in Ohio schools. I am not wanting to take all the credits to Ohio. Possibly many of you know that the centralized plan of schools has been in operation for forty years in the State of Massachusetts. We began to discuss the question for 20 years before it was adopted in a single case. It was not an easy thing to bring about and indeed there are a great many in Ohio today who are afraid to tackle this question, but I want to say to you that we have now a nucleus from which we can work. We have established enough so we know they are bound to be a success. They have been established long enough for us to know something about it. We know they are a success from a financial standpoint and from the standpoint of the people who live in the communities where they are in active operation. I want to say to you that in Ohio we are beginning to regard the centralization as something like the measles—catching. We have 33 townships with centralization complete and they are not all in the Western Reserve. However, most of them are in the northern part of the state and not so much in the section in which I live.

We have reached the time when we must educate the American farmer as much as if he were to construct an engine, and I could not help the thought of an instance that occurred in Pennsylvania. The story is something like this. In one of the great factories where they employed hundreds and thousands of men, one morning when they were ready to start the engine, that engine simply refused to turn a wheel. It wouldn't go and with all the efforts of the engineer he was unable to start the great machine. What was to be done? They sent word to the office. No one there seemed to be able to move it. They concluded to telegraph where the engine was made to have a man come to fix it, and meanwhile all those men were waiting to go to work. A telegram was sent to the city to send an expert engineer on a special train to start the engine. When the manufacturer received the telegram and inquired for the chief engineer he found he was sick and it occurred to him that the engineer's son who had grown up in the shop perhaps might be able to start the engine, and he went to the young man scarcely out of his teens and said: Do you think you could go and start the engine for these people? The young man said, I don't know, I will try, I think I can do it. He took the special train and went to the establishment and went into the office and presented himself and an elderly gentlemen said: Is your father there? He said no, he didn't need his father, he had come to start the engine himself. The man said, I dont think you will succeed, but you may try, and he went to the engine and with two or three twists of the wrench here and a few taps there at another point, he said to the engineer, turn on your steam and it was turned on, and the great wheels of the engine began to revolve as it had been accustomed to do. He said to the manager, your engine is going as usual, and the manager said, sit down and write out your bill. The young man wrote, item one, 50 cents, item two, $50.00, and presented it to the manager. The manager looked at it and said, I have no objections to your bill, but would like to ask you why you put it in this form. Said the young man the 50 cents is for the work in starting your engine, and the $50.00 is for knowing how. I want to state to you that the young man of the future will be the know how young man, and the know how young man will be a thoroughly educated young man, and I want to say further, that that will apply no where more fully than on the farm. If the farmer boys are to be educated, how are you going to do it?

I have said there are four things that are going to benefit the country, and these are the telephone, the daily mail, the electric car and the centralized school in the country, and when you have gotten these you have all the advantages of the city in the country and all the advantages of the country besides. I do not know as I can emphasize more strongly on the plan of centralized schools.

Your prospects are the brightest. You already have an agricultural college, and if I should come back to this county ten years from now I shall be able to see a plan of centralized schools by which your children can begin at the bottom of the ladder and work up to that great agricultural college and go back to the farm with a finished education. And when you have done that you have a class of citizens who can stand up in the face of all the world and say we fear no competition either of muscle or brains from any source.

I think I should have liked to have prepared a manuscript, but I knew the gentleman was perfectly well prepared, and I trust you will take the pamphlets offered and read them, as the question is thoroughly discussed and I could not add anything to it.

I thank you for your attention.

Mr. Campbell—Just one word about the school business. There has been nothing said but about the bright side. How are these schools to be conducted? By whom? You take into consideration the fact that all these small towns are controlled by local politicians, and if we have centralized schools it is going to throw them into the hands of the villages, and consequently they will be carried on by the politicians, and there is nothing worse than the local politician gang. That is the thing we will have to fight, because they will control the election and we will be unable to get a good class of men for the directors of the school.

Mr. Moore—I regret the gentleman has given Northern Illinois away to the people of Egypt.

I find the same rule holds good in Egypt.

Mr. Thurston—Among the towns along the north shore out from Chicago we have villages of 2,000 inhabitants and towns with 3,000 and 4,000. We have no democratic politicians. We have no republicans. All agreed years ago they would drop politics in the management of local affairs, and therefore we have perfect government in our local affairs, not only in Winetka but in Neutrea township. I am afraid our friend is not well informed if he thinks all our towns are run by politicians.

Mr. Fowler—Coming from the second largest city in the country I wish to say that although the mayor of the city is democratic that the city council is composed of a large majority of republicans, and it has been made so by the independent politicians. I desire to say to the gentleman that the condition he speaks of is made only by the carelessness and the neglect of the people themselves and if they take as much interest as they should in the public schools they will get out and see that a few politicians do not control the public schools and the destiny of this country. The people are to blame for the condition he speaks of and I venture to say that the people who will allow those conditions to come about are those who sit on the store boxes until the seats of their pants are almost worn out waiting for the politicians to buttonhole them. The people are alone to blame where they allow the politicians to control their schools.

Mr. Chas. Anderson—I think we are getting into a good way to get centralized schools. In '83 or '84 I lived in Ohio. In God's country and before we got the township high school. We lived in a township about twenty miles from a town of any size when we talked first about township high school. In 1884 my father died and left me with a widowed mother and thirteen of us children and I began to realize the importance of seeing these children educated so I took quite a good deal of interest in it, and when I became twenty years of age the neighbors concluded they would have me on the school board and I felt considerable dignity and quite swelled up and we went to pushing the township high school and some of the old gentlemen had all sorts of excuses to bring up against it and the more excuses they made the nearer we came to getting it. We had got an old bachelor to agree to donate an acre of land for a township high school in the center of the township so we had a meeting announced that would take place at a certain time and each member of the township board was to let it be known and they should all come and if they had anything to say they were to say it and we had the liveliest kind of a meeting. I was in the habit of attending literary society and had more nerve than some of the rest and the old farmers told me what to say and I said it and kept some of them mad all the time, and there was one wealthy old gentleman who had 400 acres and only two children both married, boy and a girl, and the boy had a number of little fellows coming on. The old gentleman had retired and given the farm to the children and he said it was an imposition for some of the poorest people to get up and push a thing like that. That nettled me somewhat. There was only a bakers dozen of us but I thought they ought to be educated and I told the crowd that although Mr. Smith was a little more prosperous than some of us yet he had a number of small grandchildren who might sometime in the future be glad to avail themselves of the township high school. Then I told a story on the old man and we got them to laughing at him and we got $2,500 to put up our school. It was to be a two story building and a kind of Martin box plan to be added to at any time and soon after I moved to this country. I went back to visit the old home after being away fifteen years and I went to this little town and this little school house of four rooms had grown to eight and a doctor who had been as much interested as myself said to me: "Did you see that young fellow going by?" I said: "Yes." "That is one of old Uncle Smith's grandchildren. Billie drank and his children now come to the township high school."

I think we are getting in the right way to get the centralized schools. Some of us are getting spunky and the first thing you know we will have it.

The Chairman: If there is no further discussion of this question I will give Superintendent Kern a few moments to answer the gentleman.

Mr. Kern: I never for a moment dreamed that the good sense of the farmers of Winnebago county, Illinois, would allow the one distinctively American institution to be tossed about at the pleasure of politicians. If there is one thing above all others where all creeds and conditions may, can or should meet, it is in the American public schools.

Any public sentiment that allows the education of the American boy and girl to be at the jeopardy of the American politician—I hate to say anything about the character of the community that turns the control over to the village politicians. Let the village schools go on as they are now. I don't mean to drag all the children to the village. I believe in the future possibility of the farm life, country life. Have the farmers serve on the school board. Have the farmers hire the teachers and the farmers look after the education of the farmers' children. That is what I am after. I do not fear the dominance of politicians in this matter. If it should ever come, God help the nation.

All of the people may be fooled part of the time, part of them all of the time, but not all of them all of the time. There will come a time when the farmer will tell the politician to go 'way back and sit down.

Thursday Morning, 9:30.

Music, piano solo, MacDowell—Miss Josephine Phinney.

The President: The audience will please rise and we will be led in prayer by Rev. P. M. Snyder.

Let us unite in prayer. Almighty God, our Heavenly Father: We thank Thee that Thy kingdom is so broad. We thank Thee that all true work bravely done is a part of the coming of Thy kingdom. We thank Thee that all those who strive in any way to make this world a better place to live in are working together with Thee. Father, we pray that we may realize these things; that we may realize our Divine fellowship as we strive in earnest and honest toil for the betterment of the conditions about us, for the upbuilding of our home and country. We thank Thee for the land in which we live. We thank Thee for the commonwealth, and we thank Thee that the foundation of its wealth and prosperity are laid not in evil, not in iniquity, not in gambling or speculation, but are laid on the farm. We pray, Father, for Your help of those striving for the betterment of life and the betterment of conditions.

We ask Thy blessing upon this gathering. We pray all counsel taken may be taken wisely and well, and that there may come into our hearts a new sense of the dignity of the work to which we are called, and with the sense, that we are indeed workers together with God.

We ask it in the Master's name. Amen.

The President: As I understand many of the schools of Winnebago county are closed today in order that the children as well as the teachers may attend the sessions today and tomorrow, I hope that the ushers will see that the seats are filled with people instead of overcoats.

The session this morning being devoted to the live stock interests and foundation of the fertility of our soils, and having with us our able treasurer, A. P. Grout, and who has since the organization of the Live Stock Breeders' Association been its worthy president, it is with special pleasure that we ask Mr. Grout to preside over the assembly.

The Hon. A. P. Grout of Winchester: The demand of the hour is for a leader—for some one to lead the fight against mismanagement, incompetency and incapacity—some one to check, and right wrong methods and rapidly growing vicious practices.

Every one who desires to be up to date, and in the front rank of successful farmers, must be on the lookout for new ideas and new men as leaders in the agricultural world, and must realize that all that can be developed in the study of agriculture has not been known for hundreds of years.

Radically wrong methods have prevailed in many parts of Illinois for years, from the first attempt at farming to the present time.

Decreasing crop yields, wasted fertility, and an impoverished soil admonishes us that we must seek better methods, better management and more advanced ideas—ideas based on scientific principles that will give increased returns without impoverishment and loss of fertility.

There is today a demand, and a necessity, for a new type of farmer—a leader among farmers—the progressive and in every way up-to-date farmer, who can take the most possible in the way of crops off of the land without impairment and decrease in its value.

The new type of farmer will not be a cropper, who year after year, continues to levy an assessment on the fertility of the soil selfishly, wantonly and without regard to future conditions or results.

He will not be the grain farmer, who has left his blighted touch everywhere, as attested by steadily decreasing yields, which proclaim the waste and destruction of the past half century.

He will not be one who sells his farm by piecemeal, year by year, and hauls it away in a grain sack.

He will not be one who labors hard four or five months during the crop growing season and is idle the balance of the year, doing nothing, making nothing, and possibly dissipating what has been earned during the few months before.

He will not be the average farmer, with just enough credulity to be easily defrauded by the lightning rod vendor or fruit tree peddler; with enough prejudice to follow the teachings of his grandfather, and too much superstition to enable him to pay more attention to preparation and planting than to the phases of the moon or the signs of the zodiac.

He will not be one who believes that the tariff, the free coinage of silver at the ratio of 16 to 1, imperialism, the Cuban question, or the Philippine islands exercise a greater control over the yields and prices of his crops than good cultivation and improved modern methods of farming.

He will not be a robber, robbing the land of its fertility, robbing his family of the comforts of life, and his children of the pleasures and advantages of youth, and in the end leaving them a miserable inheritance in the shape of a worn out and worthless farm, making true the old saying that "the man who sells grain impoverishes his children."

The coming farmer—the new type of farmer—the leader among farmers and the one who is today meeting the demands of the hour and successfully checking the waning and wasting fertility of Illinois soil, is the live stock farmer.

He is the farmer who is ever and always mindful of the good old rule of "give and take," and while taking greatly increased crops off of the land is improving and building up its productive capacity and increasing its value, and is not only adding to his own estate, but is putting his wealth in the safest and most available form. The entire product of his farm walks to market on its own legs, leaving behind, where it belongs, from 80 to 90 per cent of the fertility made use of in its production, and sleek contented animals dot the green, velvety grass covered landscape in striking contrast to the wasted, faded and worn out soil and sickly vegetation of the grain-growing farmer.

The live stock farmer is the farmer of the hour—the Moses to lead the benighted despoilers of the richest and most fertile State, naturally, in the Union, into the new agriculture that shall stop the wanton waste of fertility and add to the productive capacity of the farm, and make possible in the near future values of $100, $150 and $200 per acre for the average farming lands of Illinois.

The new stock farmer adds richness and increased productive capacity and consequent value to his land, which enable him to build beautiful modern farm residences, commodious and tidy barns, and possess the well fenced and attractive farms, which everywhere indicate the thrifty, progressive and prosperous farmer.

No greater proof of this assertion can be found. or more striking contrast be imagined, than a comparison of the methods and practices or the farmers of the southern portion of Illinois, with those of the stock and dairy farmers of the country surrounding this beautiful and prosperous city of Rockford.

I do not dare to pursue this subject farther on account of the sensitive nature of some of our Egyptian friends, and will only express the sincere hope that the great object lesson here, so plainly and clearly demonstrated, will make a deep and profound impression upon their minds, and in the end prove a great and lasting benefit to their country.

As I entered a town far south of this a few days ago for the purpose of attending an institute, the first object which attracted my attention was an enormously large corn elevator—the largest and best I had ever seen.

I soon learned that the people of that section were rather proud of the elevator and its capacity and of their ability to fill it with corn in an unfavorable year. I also noted that the corn fodder—more than one-third of the feeding value of their crop, was largely standing in the fields and going to waste.

In speaking at the institute that afternoon I could not refrain from refering to the subject, and stated that the elevator, though the finest I had ever seen, was not in my judgment an evidence of prosperity for that community, but rather an evidence of bad farming. I doubt if the statement was well received. I know from a conversation with the owner of the elevator that he thought I was teacking rank heresy and that I had made a "bad break." The interests of the owner of the elevator and the owners of the farms in that section are not the same, and time will demonstrate the truth of the assertion I there made.

Since the meeting referred to a prominent Illinois feeder, one of the new type of farmers, is reported to have said that "any man who grows corn to any extent should raise cattle or be jailed, and if he raises cattle, and fails to raise a few hogs, he should be hanged." It is a relief to know that we are not the only "crank" and that there are others as well.

Governor Hoard of Wisconsin once said, when trying to introduce "reform" in dairy manage management. "Some people are so rock rooted in their prejudices that nothing short of a special dispensation of providence will move them. Yet with the parable of the sower for his encouragement, he has gone on sowing the good seed, the result of which is apparent in his state.

The live stock farmer is the coming farmer of Illinois. He is the one logical and consistent, general farmer, worthy of imitation and following. He is the leader among farmers.

The soil of Illinois was given us for all time. In it is stored up fertility for ages to come, if treated in a reasonable and common sense way. Wanton waste and reckless dissipation of nature's bountiful supply of plant food must be checked. A reform is demanded.

We come before you this morning as the representatives of that class of farmers, who believe that the future prosperity of the farmers of Illinois, hinges largely on the live stock that eats the grass, the hay and grain, everything grown on the farm and carries only skill and the manufactured products to market.

We believe this to be the most important session of this great meeting and that the topics to be presented, Live Stock and Fertility, The Up-to-Date Stock Farm, and Improving our Farm Stock are more vital and far reaching and have a greater bearing upon the future prosperity of the great State of Illinois, if we may be permitted to say it, than all the other topics combined.

We feel that the live stock interests of Illinois are especially favored today in being so ably and capably represented by the gentlemen who are to carry on the discussions. They are experts, who know whereof they speak and are able to give a reason for the faith that is in them. They are leaders who may safely be followed.

CHAIRMAN—It is necessary to make a little change in the program owing to the fact that one of the speakers has not yet arrived so we will reverse the program today and commence with the last topic: Improving our Farm Stock by Mr. Rankin, the Secretary of the Live Stock association.

You will notice that the live stock breeders have chosen the beef type as their motto, and while the secretary has not yet attained the type of the president he is likely to get there.

MR. RANKIN—We are certainly trying to follow the example of our president and typify the industry in which we are engaged. I believe every man ought to stand up for his own business.

There is a tradition that in England at one time it was ordered that a bell should be hung in the smaller towns of the country and directions given that if anyone should feel grieved or wronged they should ring the bell and the magistrates hearing the bell should assemble and redress the grievances. The bell hung in one of the old towns for a good many years until the rope rotted away and a grape vine grew around it and took the place of the rope. One day the bell was heard to ring violently and upon assembling the magistrates found a half starved horse, old and abandoned, trying to eat the grape vine and it had all unconsciously rung the bell of justice. There are times when the bells of justice should be rung not only for one animal but the whole animal world, and I have the honor and privilege of appearing before you in the interest of improving our farm stock. While I may not be able to say anything new or startling, having no new theory to advance, yet I think the repetition of oft told truths may in some measure emphasize their importance.

I was one time asked to prepare a paper and I did so, and after reading it I met an old Scotch friend of mine, and said, Jim you heard my paper, how did you like it? He replied, weel Fred in the first place I did not like it for three reasons. And on asking him for the reason he said, weel in the first place you read it. In the second place you did not read it weel, and in the third place it wasna worth the reading.

I am not able to speak off hand on such a subject and have to use notes and I expect you will be of the same opinion as my old Scotch friend:

Chairman—The live stock men of Illinois are always on the outlook for the latest and best information that can possibly be had along their line, and if there is any place in the United States where they have any better information than we have we want it, and as has been the case in the public affairs of this country we have often been compelled to look to Ohio for our leaders. So the live stock men of Illinois have followed this example and have gone to Ohio for information in regard to the up-to-date stock farm, and we have brought from Ohio an up-to-date man, Mr. O. E. Bradfute who will speak to us. Mr. Bradfute.

MR. PRESIDENT, LADIES AND GENTLEMEN—I want you to take a little excursion trip with me this morning over the central part of the United States. However you may remain seated, but I want you to keep your eyes out of the car windows and see what you can see, and I want to start from Chicago, going across the northern part of Indiana through the northern part of Ohio in the dairy section of the western reserve, in the dairy section of New York state, down across to Pennsylvania through the feeding grounds to Lancaster, that beautiful part of Pennsylvania, and returning you work through the blue grass regions of Kentucky and up through the Miami valley of Ohio and through the southern part of Indiana to the corn growing districts of Illinois and Missouri and up through the feeding territories of Iowa into Minnesota and up into the territories of the great northwest and return back homeward through Wisconsin and this beautiful section of Illinois back to Rockford. Now I have had you take this little trip with me and what have you seen? If you had your eyes open you have seen one thing in those sections, you have seen the beautiful homes and refinement, men of ability who work the farms and who are moving right along with the times. In those sections you have seen the up-to-date live stock farmers. Those sections are devoted principolly to the growing of live stock and on the other hand when you come to the sections devoted to the growing of one kind of grain like parts of Illinois. You are Illinois people. In those sections of Illinois that are devoted exclusively to corn growing, what have you seen? You have seen in a large measure naked farms. You have seen humbler homes. Not the grand buildings you have seen in the live stock territories and I want to say to you the foundation and cornerstone of success in farming is the live stock industry. We have found that true in the state of Ohio. Years ago we thought it necessary to plow up many of the blue grass pastures and we did it and I want to say to you when we devoted our time to the growing of grain and sold off the live stock we found ourselves growing less crops per acre than we did 50 years ago. Whenever we let live stock go, we lose in fertility upon the farm. I care not what the farm may be you may keep up the crop for a long number of years but the end must come and you must return to live stock and I want to talk a little while on what I think to be an ideal live stock farm.

I cannot lay down specific rules. I cannot say what your farm shall be like. That you shall have so many acres and a certain plan of buildings. We cannot do that. We will simply attempt to give general ideas of what I think to be an ideal live stock farm. There may be some person here—a young man, who is thinking of going into a new location of starting now and building up a live stock farm and I want to call their attention first of all to the position of the farm.

I should prefer it to be near a railroad station so that you may have a good place to ship your stuff. It is not only convenient for shipping but if you are going to engage in the fine stock industry it is convenient for those who come to see your stock.

You should have good postal facilities. It is necessary for you to have a daily mail in order to keep posted along your line of business. Fortunately, through Uncle Sam's kindness it is not so necessary to be near town as it once was.

Then some reference to climate. We can't have a choice of climate as much in Illinois as in Ohio.

I would prefer a southern sloping farm to a northern slope, simply for the reason it is a better winter farm than one on the northern slope, the stock can enjoy the sunshine better and we have earlier grasses in the spring upon the southern slope than upon the northern.

Another thing I should be particular about—a good neighborhood. How important it is for a livestock man to be located in a good neighborhood; a neighborhood that is free from petty jealousy; a neighborhood where every man is willing that his neighbor should succeed and has not the feeling if he is doing a little better than himself that he must try and run his stock down. This man should say to him, "If I have nothing to please you, perhaps neighbor Jones has, and I will be glad to take you over and show you what he has."

I believe the success of the Kentuckians in their horse business is due to that fact. Should you go to Kentucky seeking a horse, I venture you will not come away without a horse. If he can't sell you a horse he will see there is one less horse in competition. I think we can get a little broader minded.

Another thing I have heard men say. I remember only a few years ago a man in our own section purchased a fine herd of cattle and located near me, and many people said, "he is going to hurt your business starting up beside you. He will injure you." I said, "he won't do that; he will help both of us." Men will come three, four, or five hundred miles to see a half dozen herds, when they will not go the same distance to see one herd. Men should have a common interest working along the same line.

You know how it is in a neighborhood devoted to the growing of hogs. The buyer starts out. Where does he go if he wants a carload? He goes to the section where a carload can be found. What does he find? He finds a class of men posted. They are informed what their hogs are worth. They are prepared to give him an immediate answer. He says, "I can buy two or three carloads here." He don't have to run all over the country. It is an advantage to him. It is an advantage to the men in the community to have a common interest, and to the buyer, so that he may know right where to go to find what he is seeking. If possible locate in a good neighborhood.

Perhaps most of us have our farms and we can't select, and we have to make the best of it. If you have a farm perhaps it may be very small, and you may choose to devote yourself to chickens; that is one branch of livestock. If you have to do with a very small farm, you may choose to devote it to some other line. It is not necessary to have a large farm. It is customary to think we need acres and acres to grow feed and pasture and have a lareg herd. Some of the best known men in Illinois, the men who stand in the front, are men who have accomplished their work on very small farms. A noted example was a breeder of this State who recently disposed of his herd at a great advantage—I don't think he ever owned 150 acres—and his herd was never greater than 50 head, and his name was a household word on two continents. So it is not necessary that the farm be a large one.

As to the arrangement of this farm. Every man should arrange his farm to suit his own convenience. I want to make the central idea convenience. On the stock farm the first thing that ought to be considered is the water supply. It must be arranged with some reference to the source of water. That is the one thing he must have in abundance, pure, living water; and that in the greatest of abundance if he is going to succeed with livestock. It is not necessary to locate in a hollow because the spring is there. We can get water where we want it. I notice a great abundance of windmills in traveling through the country, but there is another method that is not so frequently used, and that is the hydraulic ram, to convey water wherever you wish it. I do not think the farmers appreciate how the machines work, and when once established you have a perpetual flow. Three or four feet will raise the water for a long distance to 50 feet, with less in proportion to the height you want the water. I understand you have many springs in this section, and a beautiful river, so that you can have a running stream.

We have such an arrangement and have never had anything that has given so much satisfaction as a living spring and last summer it went dry and is now dusty, and so something else had to be done, and we have replaced it with a ram and it has given good satisfaction. I think you could use them to great advantage in this section.

Let me tell you of something of the arrangement we have on our place and perhaps it may be useful to some of you. Not all can arrange their farms alike and it is a matter we can not agree upon. We are fortunate in having a small stream that runs the full length of the farm, near the house. We have small, blue grass pastures, of thirty acres each, that are arranged for and are permanent pastures. These pastures open into the back-lying fields and along the stream are rough and not so suitable for farming. Back we have the land divided into fields, with gates opening from the small pastures and when we have the fields in pasture we can let the stock in the upper pastures down through the blue grass to the water, and we get a variety of pasture, and especially if cattle, they like to stay near the water. The upland fields are in timothy or clover and the stock receive a variety, being in the upper fields during the day, except in the hot days when they go to the water.

A word or two about the fences. Every farmer should have good fences. I am not here to tell you what kind of fence. I do not think a perfect fence has been invented. We have tried from 20 to 25 kinds and have found no "best fence" for an all around farm. But there should be good fences. Your stock has no business to trouble your neighbor any more than the neighbor should trouble you. It is all right if our stock gets onto our neighbors, but if his stock gets unto you it is awful. His stock has no right there; neither has yours, and so let our fences be good.

An abundance of gates about the buildings. I want the gate to be on hinges so that if you want to open it or the little boy wants to open it you can do it and have fasteners that will stay shut. Up on hinges and properly fastened. Back on the farm we find the common western sliding gate. You know how it is made. It is old but the most practical. We like a gate between each field so that if you want to get into an adjoining field you won't have to go through the fence. The gates can be made of any width but should be of a width to let your binder through and that does away with letting down the fence so they can get through.

Abundance of lots for winter use. In how many places do you see horses, cattle, sheep and hogs apparently all feeding together. The horses can get along, but the rest of the stock don't do very well. They are getting too much exercise and therefore I would have an abundance of lots. I would separate every stock except hogs and cattle. They can and must go together to be profitable. Put the sheep by themselves and horses by themselves and separate in accordance with the ages so that when anyone comes to see your stock they are uniform. They are all one size, all one age and have an equal chance. I am somewhat of a crank on this subject, if you please.

About the buildings. What shall we have? I like to see beautiful buildings, substantial buildings, but it is not absolutely necessary that the buildings be beautiful. It is necessary they be substantial and convenient for the purpose you are going to use them. How inconvenient are many of the barns, especially in the older states. In Ohio we find barns built for one purpose and the present owners are using them for an entirely different purpose and it is the most inconvenient arrangement, consequently expensive. I have seen a man use a barn where he will use enough steps to go to Jerusalem and back in doing his work. I have seen men climb up a ladder to get upstairs and there was a board he always had to dive under and every stranger had to learn the little trick by having his brains knocked out. Some of you have to go clear around to get into the barn at all. Let us have the barns convenient for the purposes built and for which you want to use them. Thew should be substantial and if you can afford it elegant and well painted.

More than that I should want it well ventilated. I am glad to see the excellent buildings between here and Chicago. I could not criticize the buildings but in many parts of the country and I fear in some sections of Illinois I would not need to make a very long speech on the ventilation of barns. There are a great many barns that have not the crying need of ventilation. A door off here and a great hole there. I don't think that farmer would appreciate a sermon on ventilation. I have often thought when I see a barn open clear through the center I would like to get that farmer and tie him up and take off his coat and tie him up over night in that place and I think by morning I would not have to read him a lecture on caring for his live stock. Let us ventilate so the draughts of cold air do not strike the animals. We want fresh air. I don't mean we can't have the air cold. Let it get cold. Below freezing for that matter unless you have young animals to take care of. But don't get it from the open door but from trap doors or sliding doors away from the animals and convenient for the purpose you want.

Now about the pasture. I should like a variety of pasture. One of the fundamental things is a variety of pasture. We know how it is, we like variety upon our table. We like it if possible every day and therefore I should say, "Let us have a variety of pasture." In this section of Illinois we can grow a great variety of pasture. In some sections it is not practical, but get as great a variety as you can. Grow a variety of feed stuffs. Grow as near as possible everything you wish to feed and then have a variety. Corn is one of the best foods, but it will not do to feed corn all the time. I would rather sell some corn and buy something to add variety. The stock feels better. I know we some times think we are giving variety if we give corn on the ear today, ground corn tomorrow and then shock corn. That is hardly variety. If we have three meals a day, one of oat meal, one of corn meal and the other of mush that would be hardly enough variety to suit me. Then grow a variety of feed and feed it to your stock. I would not sell an ear of corn for anything. I do not know when I have sold an ear of corn. We cannot afford to. I want to feed it on the farm and let my corn walk to market. I want a variety of feed for the stock.

Save all your manure and return it to your farm. I do not need to talk upon the necessity of this.

I am not here to tell you the kind of stock. Every man must select the kind of stock that suits his convenience, his idea and his markets. Do not forget to suit the market which you must cater to. Study the market and grow live stock that is best suited to your market and supply what the people want instead of following your own ideas. If butter is 30 or 40 cents for a certain quality what is the use of selling for 20. Therefore supply him what he wants. There is a profit in growing what the other man wants. Therefore study your market, but I should have variety of live stock. I should not put all my eggs in one basket. If the one thing goes down the other might go up and I should catch them either coming or going.

Do not overstock your farm. Rather have a few good ones than a number of poor ones. How many farms are overstocked? I have seen farmers that where a number of stock went nicely through the spring season and the summer season came on and the man lost all he had gained. He had overstocked his farm. He gained the early part, then lost and had to feed in winter. He should have just enough so that he can carry them through the season. Have a few good ones that will top the market and they will pay you better than inferior ones that you are not able to care for properly.

If I was a young man I should adopt some specialty. It is the age of specialty. We have specialties in everything else and why not among the farmers. We do not want to have one kind of stock alone, but I want to take some one kind and make a specialty of them and I believe it to be the duty of every young man to show to the world he can do some one thing better than anyone else has done it. I should say adopt some specialty and say to your neighbor I can produce a better animal of this particular kind than anyone has yet produced. I want to say if you make a success the world will find it out soon enough. Some of you will say I don't want to bury myself on the farm and get lost, no one will ever hear of me. I want to be president and go to congress. Young men, I can name men known on two continents who are devoting their lives to farm work and were known more favorably throughout the length and breadth of the United States than the average congressman, who stand higher than the average congressman. There is a chance for you young men upon the farm in the growing of live stock. There is a chance to become famous. I am very fortunately situated in our section. I am in a section devoted to live stock growing and there are no less than 20 to 25 young men who have taken up a specialty and those young men, ten of those young men have sent their live stock to half the states in the Union in the past year. I can name you men who are known in every state in the Union. Men who have received letters from every state in the Union the past year and many from the foreign states. There is a chance for the young men to succeed and I hope more young men will embrace the opportunity.

If we have this beautiful farm, this well arranged farm, the stock, the live stock of every kind, it would certainly be unfortunate with all of this equipment to have man at the head of it not up to date. It would be an unfortunate arrangement, and, therefore, I want to say that an important feature of this farm must be an up-to-date man at the head.

What constitutes an up-to-date stock farmer? I am sorry I did not hear the address of Mr. Carter on Tuesday evening.

First of all he is a gentleman. A gentleman. I have heard Mr. Kerrick say that a gentleman has gentle stock, and I think he was right. The up-to-date farmer is a gentleman in everything the word means. He is a polished, finished gentleman—a man with whom everybody likes to associate. A man whom everybody likes to meet. A man of culture, who can receive a person and make him feel at home and go away feeling they were glad to meet him. He is a business man. A business man. You know there is no one thing I hear about farmers so much as their lack of business qualifications. We don't do business, as the saying is. We don't always keep our word, because all of you who have been on the board of exchange or the board of trade know how thousands and thousands of bushels of wheat change hands with a signal, scarcely a word spoken and each and every one of those men comes up and settles to a penny, even if it takes his fortune. It is business. You have seen Illinois farmers who will agree to sell his hogs for so much and if he discovers hogs have gone up will go back on his word. It is not business, gentlemen. We want to be known as business men. We want to do business promptly and be prepared to do it on the spur of the moment so that every man with whom we come in contact can say he is a business man and understands his business.

He wants to be honest. Are we all honest? If you think of going into the live stock industry that aims to produce pure blood live stock, if you don't know yourself to be absolutely honest, don't go into it. You will get caught. There are just as shrewd men watching you as you are. You will get caught. If the man who undertakes to raise live stock is not a thoroughly honest man he had better not go into it.

What means a pedigree we write? Who do they mean? They mean every word is certified to as correct and the man who trifles with a pedigree can never hope for business success. Many of you have attended sales where two men have put their stock up to be sold. One stock seems to be bred just as well as the other, and when they are disposed of one has almost double the price of the other. It wasn't because the stock wasn't as good. It was because the buyers had good reason to lack confidence in the honesty of the other man. You must be a man in whom your neighbors have confidence.

You must be a broad-minded man. You must see good in other people's stock. How often it is that we fail to see anything good in anything but our own. The man who is the success must recognize that the other man has better than you have and find out wherein his excels, for if he keeps on going along a certain line he will find some morning everyone else has outstripped him and he is clear behind. The men who have made success are the men observing what the other fellow is doing. He is a broad-minded, energetic man. I think these would make up the qualifications of an up-to-date stock farmer.

I have not said a word about his home. Need I tell you anything about his home? A farm of this kind. A man of this kind at the head of it. Need I tell you what his home will be like? The home must be a cultured refined home; in so far as he is able to do so a beautiful home and a home in everything the word means. And I want to say I believe the man who has this up-to-date farm, is this up-to-date man, with up-to-date stock, has the happiest home in the world.

Chairman—I want to explain, the next speaker was not selected as typifying the beef type. You all understand, however, that sometimes very choice articles are wrapped up in the small packages.

It is hardly necessary to introduce to you Professor Holden.

Prof. P. G. Holden—I wish to thank your president for his very kind words of introduction. It seems a little strange that I should perhaps appear before an audience of live stock people as you are largely.

LIVE STOCK AND FERTILITY.

PROF. P. G. HOLDEN, Bloomington.

Live stock and fertility is the question which the committee has assigned me to speak upon. I know of no question today in Illinois which so deeply concerns every farmer in the State than this question of plant food. The question of fertility as we call it. Take away the fertility of this soil and we have a Sahara desert. Other things being equal we must measure the value of the land by the amount of fertility it contains, the amount of plant food. It is time we are attending to this matter. It is only a few years ago—it is only a few hours ago that our fathers came to this State and its broad acres and broke for the first time this virgin sod. We have had to concern ourselves too often with building our churches and school houses and all our own improvements on the farm and in doing so we have neglected often times this very important thing of plant food. We used to let the cattle roam and forage over these prairies. We didn't consider it of any value and when we came to the winter we put some hay and grain under cover, ond our only thought was to see if we had enough, but we never measure the plant food that must feed the plant on which all the success of Illinois depends. Every industry, the railroad and the humblest home all depend upon the fertility of the soil, and we are just approaching a time in our history when our method must change and change rapidly.

As I come from Chicago I noticed the corn nicely cut up and it is being fed. I notice the dairy wagon in the town. What has brought this about. Answer, the farmers have been driven to raising stock.

It is possible for us here in Illinois to so use the elements of fertility that we can go on and produce maximum crops for thousands of years, and on the other hand so use the fertility that within a hundred years we can practically exhaust the soil until we must feed it plant food. I want to call your attention to how little we have understood about plant food. We say that the farm is exhausted, run out. Now, that does not mean we have exhausted all the fertility of the soil, that there is no longer any plant food. I have felt like thanking the Lord for locking up a portion of the fertility away from us, saving it for our children and our grandchildren; for we would have had it all turned into gold if we could have gotten hold of it in our competition with the east. Our farm has been able to support the tenant and the landlord, and the landlord got tired and moved into town. He thought he was tired. There is nothing so tiresome as idleness. What business has the farmer in living in town in idleness, his greatest drawback, for there is nothing that will tire him like idleness? He has moved to town to educate his children. This is ofttimes times true, but I fear in many cases only an excellent excuse. To educate the children. Don't feel he could spare them from the home. One of the best things in the education of a boy or girl is to place the child on his own responsibility away from home, and you have done more to make the boy or girl great than anything else you can possibly do. You need society. How much do you have of it after you have spent your active years on the farm? Now how much of society will we get in town? How much do you enjoy of that kind of society? The people call on us and we try to say nothing for fear of being quoted at the next house. Society, what is society? Many of us know and have found out that we appear like bumps on a log in society. Out of place. What is the effect on the farm? A man said to me, "What kind of fertilizer can I get to put upon my soil? It is not producing as it used to produce." I said, stock. But he said, "Mr. Holden, I can't trust stock to tenants." My dear sir, you will be forced, driven to it. No matter whether your tenant can handle it, there must be stock if you are going to keep up the fertility. Nature will not restore it if it is taken out once. Where is it coming from? It must come over the railroad. It must come from the chemical laboratories. It must be made. To bring np the land of the farm, what do we mean? There is a great difference between an exhausted farm and one simply run down. Now our success in agriculture or success on the farm depends upon the available fertility that we can keep ready for the plant to grow upon. The fertility of the soil exists in two conditions, available and unavailable, the unavailable being locked up until chemical action goes on and the elements can be set free. If we can turn back enough fertility to offset what has gone into the crop we can go on producing and can even increase the products of the farm. So we can increase the fertility of our farm, the available fertility; but even if we turn back all the manure, still there is a little loss; there must be. To illustrate the increase of available fertility, suppose I have here a glass of ice, with a little water available to drink. Let it stand and the action of the air melts the ice gradually. There is a certain amount we can't get and we must wait for time. There is a certain small amount available, and it is the available fertility that is necessary for the profitable and economical production of crops. If you turn back the manure we can keep up the available fertility and go on producing crops for years.

I have been studying for sometime the question of the effect of three systems of farming. What should be the result if we should be a specialist in agriculture to this extent. But we must only suppose as corn raising and stock raising must go together. There is no other solution. Let us start out today. There are hundreds and thousands of farms today that are conducted on that plan. Here is a landlord who owns one hundred or a thousand acres of land, of the choicest land. No stock upon the land except just enough horses to do the work and everything is sold. I can pick out every one of those farms today. But to return to our system of farming. If you start on the plan of raising corn, oats and clover year after year. Turn the clover under, if you wish, it will exhaust the soil quicker that way. The effect of such a rotation I can't give you in detail, only in a general way. If we should crop the three crops continuous and get full crops of them, there would be enough nitrogen in the surface foot of this soil, and the surface foot contains more than the next two and one-half feet, to last 62 years, enough potash to last 100 years and enough phosphoric acid to last 144 years. There is a little sentiment connected with this. It is not merely a matter of business I want to talk to you about. We owe to our children and to the children that follow them that we should turn the land over when we are through with it, in just as good condition at the end of the sixty-two years as we received it.

In another rotation using the same crops, but suppose we feed all the clover, the stalks and straw and sell the corn or its equivalent there is enough nitrogen to last 300 years if there is no loss by drainage and through other sources, potash to last 1,200 years, in selling off the corn we have retained 40 pounds to turn back. In Central Illinois we burn the stalks. There is enough phosphoric acid to last 400 years,

Suppose we adopt another plan. Feed every pound of stalks and every pound of the grain, there is enough fertility there to last, with a little bit of loss in beef and butter, there is enough fertility to last them thousands of years. I wish we could go into our fields and inventory the fertility of our soil. I wish we could do as we can go into our barns and inventory the stock.

It is not sufficient to simply feed the stalks, but in central Illinois the first, the greatest and most important study is to plan our work, to feed and utilize the stalks, as one-third of the feeding value lies in the stalk. You have too much ruffage. It means greater productiveness. They are doing it in Minnesota, in northern Illinois and in Ohio. They have to do it, and if we in the time of prosperity can look a little ahead and adopt the method before we are driven to it or it is considered necessary, it will be fortunate for us and the great State. The animal is the great converter of the elements of fertility in our waste product. If we plow under sawdust it is fertility. Corn stalks by chemical action are made available for plant food. If you have used the liquid manure to put upon the soil you have the elements largely available immediately. You are adding to the store of the available fertility, the melted fertility as it were. You must utilize the stalks and straw; we are to plow the stalks under. A great many farmers think they are doing a great deal for the children by plowing the stalks under, as it takes a long time for the elements to become available, and in a season like last season, when the dry spell comes, your crop will suffer more after the stalks have been plowed under, and so you burn them and give off the nitrogen into the air and there is a tremendous waste. But we need to utilize the waste product. When we need something with more proteids in them our clover or cow peas will help to balance the ration and enable us to make good use of the elements. Now, a word in regard to clover. As I have said to some of you people before, if I wished to exhaust my soil in the most rapid manner possible, I would grow clover and turn it under and sell those elements off in the way of oats and corn. I would rather you would sell clover than the corn and oats produced from it. When you sell the corn and oats off you are taking whatever the clover got through the roots. You have used the clover for a double purpose.

In the first place I ought to have called your attention to the amount of fertility. Taking this block of earth. That would be all the fertility there. In a crop of clover 100 pounds is used; in a crop of corn 64, and in a crop of oats 50 pounds. In the roots of the clover there is another 100 pounds, and if you will plow under the clover you make available the 100 pounds and also the 100 pounds in the roots, and for a few years you will get better crops, but experience has taught us it will exhaust the soil and takes manure to get the clover started again. How many years?

Well, it varies a great deal. In eight or ten years you will find a very great change It has the appearance for a short time of enriching the land. It is increasing the available fertility but drawing upon the non-available. There are no crops equal to clover and cow peas to exhaust the soil.

The Illinois farmer should not sell off his stock as he has no way to utilize the waste material and ruffage. They should make their sons and daughters their partners and remain on the farm. A tenant system is not the best system of agriculture for any country. The stock goes down, houses and fences go down, fertility suffers. Society is coming to us on the farm. The steam rail has come, the telephone is here and coming and the rural mail and electric cars are here and coming. There is no excuse for leaving the fårm. There is no such place that makes as wonderful a home as the farm, and if we are to conserve the fertility we must live on the farm. We have been resting our ground in central Illinois by changing the crops, changing our fields of corn, oats and clover. I have seen thousands or hundreds of thousands of acres rested in that way. If you should meet a boy running and should say, "What is the matter?" You would be surprised if he should say, "I am just resting." And so we rest the ground by putting on another crop of corn and oats. As I was about to say I have gathered together data from a great many farmers, those who have followed the system of selling the corn and feeding the stalks; those that have sold corn and oats; those that have sold the stock. The man with the stock is way ahead.

I want to thank you for your kindness in listening to me so patiently, and I hope when you go back home you will organize some classes and study this matter. Get the boys and girls together and get King's book on the soil, get everything you can together on the land and soil, and study it. I tell you the question lies at the very foundation. We must give it our attention.

Chairman: It has come to be a well known fact that Mr. Kerrick of Bloomington has become necessary to us. To him we look for a great deal of inspiration, and this session will not be complete until we have a few words from Mr. Kerrick.

MR. PRESIDENT, LADIES AND GENTLEMEN—I was raised in southeastern Indiana, but have lived about all my life in Illinois. We had a good many spring streams in those days, had little waterwheels all about, and I think some of you have lived in a neighborhood with these little waterwheels. They don't always have wheat to grind, but power costs nothing and the miller has nothing else to do, and when the wheat was ground up he would run on for a while; and if you asked him what he was doing he would tell you he was running on tailings from the poor grist, that was left. The president, finding himself with ten or fifteen minutes and the grist ground up, is going to run a few minutes on tailings; and he knows I am good natured, and in that respect he has picked his man.

Having no subject, I will take advantage of this occasion to say to you just what has run in my mind for some time, and this is probably as good a time and as appropriate as may come to me to speak upon the subject, and it is quite in line I think with what has gone before, but it will not be just the same.

We have heard much at our institutes about raising corn for the market and livestock for the market and oats and wheat for the market and butter and milk for the market, and we have in mind pretty strongly that notion of raising something to sell, raising something to meet the market, raising a whole lot of something for other people, and that is quite the mental attitude of farmers in general I think, and we are apt to lose sight of the great thought, the great idea, that after all the idea of the farm home and the highest idea of the farm, is to provide a place on the farm where a family, its mother and father and the children, may have there and produce there for their own use, as nearly as possible all that they need. Is not that after all the real and best idea of farm life? My dream of a farm and a farm home is of a comfortable and commodious house and good barn, and then right along comes the orchard and the garden and even some beehives, and chickens and horses and swine and cattle and sheep, and everything on that farm as nearly as can be provided there for the most perfect comfort and happiness and welfare of that family living there and in that home. That is my dream. To think less of what we have to sell for somebody to use, and if we have too much for somebody else to speculate upon. Now, lining up perfectly with the idea of the farm home, live stock fits exactly. You can not have it without livestock. The idea of farm life falls far short of what it ought to be without livestock. I do not quarrel with any man about what kind of livestock, whether it runs mostly to cattle, and that to beef cattle or the dairy cattle—that makes little difference to me; or to horses or to swine or to sheep or to chickens. Chickens are a great thing. I don't believe we have heard from the chickens man, I don't think he is on the program; but if he is, we have the biggest thing to hear about; it is the chickens. Farming without livestock is only half farming, and that is saying nothing at all in derogation of grain raising; but grain raising by itself is only cropping. We used to have in this country a large class of farmers that were called croppers. They only raised grain to haul off and sell. They did not need to own a farm, just get hold of a piece of land and raise the grain. They could sell everything except what they required to feed the horses. It is only half farming. You have been told altogether better than I can tell you, even if I had time to prepare, of the exhausting of the soil without stock.

Livestock farming implies so many things. Among the very first I would say that it implies grass. After all the greatest thing in all the world is grass. You can't think of livestock farming without grass. There can't be a livestock farm unless it be in some good proportion in grass, the clothing of the earth. The Scriptures tell us that God clothed the earth with grass. It is a protection to the earth, the great restorer of the earth, it is the salvation of the earth with all its fertility, and I can't think of a farm I know that is beautiful to me that is not in some goodly proportion under grass. The other kind of farming leaves the farm open year after year. It is open in the spring, it is open all summer and in winter, and the Almighty invented snow when grass wouldn't grow to cover it and because he wanted it clothed, and I look over the snowy fields and I think what good shape the ground is in. It is the next thing to grass. You can't have livestock without grass, and I have had a great deal to do with raising livestock and feeding it and believe that one-third easily, I don't think that I am putting it too strong, that any man with a good quarter section may keep one-third under grass in order to provide a place and room for his stock, and in the course of 15 or 20 years with that kind of farming, changing the grass from one part to another, he can leave one-third under grass and have all the comfort, pleasure and beauty that grass implies, and get more out of the two-thirds than if he had no grass anywhere, and besides he will leave a fertile and beautiful farm, better and more fertile than he found it, to his children.

I might tell you of a little experience I had with a piece of land in McLean county. Very likely you have heard it, but I will tell you again in figures, using names and dates and places. I see my nephew, Mr. Frank Funk, sitting over there and I know he will throw it up to me if I don't tell it straight, and I will try to do it.

I came into the possession of a piece of land when I was first married, and I will not tell you how long ago, because that has nothing to do with it. You don't need to know, but it was the worst run down farm we had. It had been cropped year after year and year after year by non-residents on other farms, and they had done a low grade of farming. They had even raised flax, the most exhaustive crop that can be raised. We put it under grass and put cattle into the field and fed as is our custom in the open field. A few years ago we opened it, I think 80 acres of it that lay next to an adjoining farm, and rented it to John March, a democrat. I don't think they are quite as good farmers, as a rule. He has had now four crops on the land. The first crop was 76 bushels of corn, the second crop was 81, and the third crop was good for 90 bushels of corn up to the time of the great storm which twisted it up, but he gathered 70 bushels, and this year 42 bushels of corn. The figures are correct as nearly as I can recollect them. You know about the average price of corn during these years. I got half of the crop and he would have taken more acres of land if he could have gotten it. If we had sold the grass for the four years for the average price we would have received a good rate of interest on land worth $240 an acre for the four years. Do you wonder land is worth $125? If we don't raise a thing for eight years the land will be worth $120 an acre. It was grass and livestock that did it.

Suppose we had gone on the old way of cropping it, where would we have been now? A man said, "March, you are paying pretty big rent." He was farming another piece of land that has had no cattle on it for more than 25 years, and he said the half of my crop that I took back with me was just a little more than he got from the other piece of land he farmed. That is the figures, and I assure you it is a fact. I think good beef cattle among the various classes for Illinois are the best adapted to the maintenance of fertility of soil, and you have a right to your opinion and a right to be guided by your own experience, and, of course, if I had handled other kinds of stock my opinion might have been modified; but I do recommend to all farmers, whether large or small, whether you farm 80 acres or 160 acres, that you raise livestock. You are not farmers until you do. You are one-half farmers or three-fourths, but to be whole farmers, the kind that conserve the soil, and the wealth and standing and power, you must be livestock farmers; I am well satisfied of it. It is the result of my general observation that the men who persist in raising their livestock, whether tenant farmers or landlord, whether the owners of large or small tracts of land, those who persist in raising by intelligent methods some good classes of any kind of livestock, are the men who succeed, who finally own land, have standing and influence in the community, and are men of the greatest wealth. I think that is a true proposition, and could give you by name and give you dates and places and all the earmarks of authenticity, cases of men who started with nothing, maybe quite a while ago. I have been intimately associated with them, had business relations with them for a long series of years, and they now own good farm homes and every comfort for the family, who started with a farm maybe not entirely paid for, but in every case of that kind coming under my direct observation they have been men who have had some good horses, some good cattle, and some good sheep or hogs about.

There is another kind of livestock pertaining not to the fertility of the soil. The greatest livestock—after all that is what all of this means and what we are striving for—the most valuable livestock are the people, the boys and girls who live on the farm. After all, what makes land worth anything are the people who live on it. This land wasn't worth anything until there were some kind of people. It wasn't worth anything. When we got some inhabitants it was worth something, when we got a more intelligent people it became worth more, and now that we have the great population, the great farming population of intelligent men and women, now that we have it well stocked with people, we have the highest priced land and the greatest agricultural state in the world. After all, it is the people who make it. There is no farming interest I know of that is comparable at all with livestock raising as a means of interesting and entertaining and educating your young people. My crop, my grain farming, is an uninteresting business to the boy, who comes out of school in the spring and the ground is plowed and the corn planted and the oats sown, and then the warm and dry weather and a little harvesting, and then some threshing, and then some corn husking, and then a little bit more school, and then the next spring. You may expect nothing else but the boys will get tired. It does not engage the mind, there is nothing for mental growth. They see greater activity in the city, they see something there to engage the mind, they leave the farm and go after it.

Livestock will interest them and engage them, will educate them. You all know how it is when you go off and buy a pure bred mare or a dairy breed of cattle, or a hog, or a sheep, how the boys will immediately become interested. They are comparing it with the neighbors', or the one they had the year before, and the progeny comes along and they want to see it. They are anxious to examine it and decide its qualities. They are held, they are interested. There is nothing like it on the farm.

Now, if I have just started you thinking on this line, if I have just said enough that might for a moment turn your ideas towards the other idea of making a real farm home with every comfort and luxury, then maybe I have run the tailings as long as the president expected, because that is a thing you can't keep up forever.

I thank you for the very kind attention, and the president for his very gracious introduction.

The Chairman: We have just a few moments more, and we have with us a member of the Pure Food Commission of Illinois, Mr. Patterson.

Mr. Patterson: Mr. Chairman, Ladies and Gentlemen—The question as I understood it yesterday was raised as to whether the Pure Food Commission had jurisdiction over the adulteration of food you feed to cattle and horses. I will say, unfortunately the law does not extend that far and I am sorry, as I understand a great many people are grinding corncobs and mixing it with bran. That is fraud on the face of it, and I am sorry the commission can not reach it.

We find in a town not very far from here there are process butter concerns, making what they call process butter and putting it upon the market without being labeled. That is a product that you are naturally interested in. This process butter you understand is made from old butter, it doesn't matter how old or how many flies or bugs or hair or dirt of any kind. They renovate this butter and sell it for good butter. We now have three cases in the court of this county where the people of this community have been putting this production on the market in competition with the genuine article and selling for one or two cents less, and without any label on it, and we now have those people in court, and I want to say that if any of you people in your respective counties of this State know of anybody selling process butter or any other adulterated food without the proper label, it is your duty as citizens to report that to the Pure Food Commission of Illinois, and those complaint cases we take up first. The Pure Food Commission has a good many cases of the adulteration of vinegar shipped in from other states. We have had a great many of such cases and we have prosecuted those people for putting the vinegar on the market as pure apple cider vinegar.

I was raised on a farm myself and my duty was to milk eight cows under the direction of my mother, and take them to pasture and bring them home, and I know what it is to work on a farm. The farmers are the producers of the world, and they not only put forth the greatest men of the country but they are the people of the country. You do away with the farm and the city man will starve. Every encouragement should be given to the farmer, and I have been glad to hear the discussions here and especiallly upon the subject of the centralization of schools. It is a great thing, and as I have said before I desire to help it along. I have a farm in Cook county and I will give to the township of Bloom, if they will build upon it, a site for their school. I drove over to Roscoe, ten miles, on good roads, and this is the greatest country road I ever drove on, and when I arrived there this gentleman who took me there showed me a hog or pig but six months old that weighed 750 pounds. That pig will take a premium at most any show; it would take a premium at the international stock show. All of these things are advancing the farmers.

I appreciate having a moment with you and I desire to say in conclusion that your convention is a great convention, you are a great people, and I see a great many ladies here, and I tell you when you have the ladies interested in anything it is always a sure go. I hope we will hear from you all, and I assure you the food commission stands ready at any time to help you. That is what we are paid for and you are the ones who pay us, and we desire to help you all we can, and I hope the food commission will hear from you all.

Thursday Afternoon, 1:30 O'clock.

Domestic Science session.

Mrs. Joseph Carter of Champaign, chairman.

Music, Ladies Trio, "Hearts Delight," Wekerlin; "My Flaxen-haired Lassie," Koschat—Mrs. O. R. Brouse, Miss Sarah Williams, Mrs. Elliott West.

The President: The welcome extended to the Domestic Science work will be given to you in the address by Mrs. Root, president of the Rockford Federation of Women's Clubs. I have the pleasure of introducing to you Mrs. Root.

Mr. President, Ladies and Gentlemen—It is my pleasure to bring to you a most cordial welcome from the Federation of Women's Clubs of this city. This welcome voices the sentiments of 220 intelligent women, mostly homemakers and housekeepers, who recognize the power and promise that resides in the Domestic Science Association; power to unlock the treasuries of State and city, wherewith to install a department of Domestic Science in our universities and public schools; promise of the good time coming when every woman shall be qualified to select and prepare such foods as shall best develop the physical and mental powers of her children.

A little boy was asked by a neighbor what his mother was doing. "Oh, nothing; she's just walking back and forth from the kitchen to the pantry." Alas! How many share the boy's opinion of housework. You have come to teach us the great issues which hang upon that walk and how to take the fancy steps.

The club woman has borne many buffetings at the hands of the funny editor, but no taunt has entered her soul with a keener pang than the charge of neglecting her home. Behold, here we see an association of women whose very name, domestic science, means "to know the home." What is it to know the home? A homemaker should be a chemist, to cook and clean; a plumber, to look after drain and water pipes; an architect, to provide proper ventilation and secure enough closets; an artist, to furnish and decorate her home; a lawyer and judge, to plead and decide the case between housemaids or children; a financier, to administer the family income. She should be her husband's mentor, and while performing these simple duties she must also be the dynamo for generating household sunshine and bear an olive branch in her hand.

This is the goal which the Domestic Science Association holds up before its disciples.

We bespeak your influence with our city council to convince them of the value and philanthropy of such a department in our public schools.

We have in Rockford 1,500 girls and women employed in our factories. Most of these girls enter the factory as soon as they finish the eighth grade school work and remain until they are married. Thus they enter upon their lifework with absolutely no preparation. Imagine such a bride beginning housekeeping. She looks forward with delight to having a home of her own, and thinks it will be play to do the work for two. Soon she finds her soul vexed by questions she is totally unable to answer. What makes the gravy lumpy? Why is the custard watery? My bread is sour: what is the matter? What does make my starch stick? And so on, *ad infinitum*. We welcome you as the great answer of her questions and the inspirer of an ambition in the heart of every girl to become an intelligent, competent housekeeper. We pledge you that our young bride is "Happy in this, she is not yet so old but she can learn; and happier in this, she is not bred so dull but she can learn. Happiest of all is that her gentle spirit commits itself to yours to be directed."

It is a happy, hopeful sign that your association works for the upbuilding of the home, that center round which a woman's life revolves, and dear as the apple of her eye to every true woman's heart. May your organization live long and multiply a thousand fold.

The President: Before calling the next number it is nothing but just to the officers of the Domestic Science Association as well as the other speakers that I give an apology for my early beginning. Our programs call for 1:30 and they had a business meeting at that time; this session not to be called till 2:00, but we had no notice of it and have insisted on promptness at all our meetings. This accounts for the apparent discrepancy, and I now have the pleasure of introducing to you Mrs. Joseph Carter, who will preside over the meeting.

Mrs. Carter: There is no apology due us. We are glad the president took up the work and are glad it is done.

The response to the address of welcome will be given by Mrs. Davenport.

Mrs. Eugene Davenport: We are assembled from all parts of the State to discuss those things which pertain to the physical welfare of men so far as relates to those conditions which may be controlled in the home life.

Since earliest times men have met to talk of those things which interested them most. At first they were infatuated with the workings of their own minds and so turned their thoughts within, endeavoring to analyze their own senses and reasonings, but entirely apart from the physical being.

Outside of themselves they were attracted by the heavenly bodies and attempted to explain events of human life by the influence of the stars and planets. The astrologers early came to be a large and influential class. Speculative philosophy was the favorite field of mental activity, and even as late as the middle ages men spent much time in speculating upon how many angels could dance upon the point of a cambric needle.

It is only until recent times that the thoughts of men have come down to earth and the conditions of immediate physical surroundings have been studied.

The alchemists strove to find an elixir of life but it ever eluded their grasp. But as is well known, it was through the discovery of one of these alchemists or chemists, Louis Pasteur, that is due the present knowledge which so materially affects our manner of living as to our physical surroundings.

With the discovery of bacteria we have come to understand better the nature, or at least the sources, of disease, and we no longer attribute a scourge of disease to a condition of the planets, but instead look to physical surroundings to discover the cause and stamp it out. From this knowledge has developed our modern sanitary science.

In times not long since passed, the pale face and stooping, emaciated form were the signs which announced to the world that a man was a student. In fact it was a part of the religion of those times to "mortify the flesh." If the poor body cried out for its needs that cry was attributed to the devil and was considered as evidence of spiritual weakness, and so was to be put down and utterly disregarded.

We have but recently learned that the elixir of life is not to be brewed in the chemist's laboratory, but is to be found in the bounding spirits which arise naturally from a healthy body well nourished. To obtain this good health we must study the needs of the body and fulfill the conditions which tend most surely toward warding off that interference with the body which we call disease.

The laws which govern the physical well-being of man have been last to be discovered--they are just being discovered. This new science we have called domestic science.

At last the women, the keepers of mankind, have come to appreciate the importance of this new knowledge of the physical conditions of life.

It means much that meetings and conventions are being held to discuss the different phases of this new form of science—it has taken its place among the important subjects of study. The women of other countries than ours are interested in it, and are endeavoring to spread its gospel in their own lands. Last year a lady, Miss Ravenhill, came from England to learn what was being done in domestic science in this country, and in one of the provinces of Canada is an organization similar to ours.

This subject is one which touches every home and every individual of whatever class. It includes every phase of home life and its surroundings.

A knowledge of the subject therefore is a necessity to every woman whether rich or poor, married or single, mistress or maid—certainly no woman should consider that she has completed her education until this subject has been studied.

To make it possible that it may reach all classes, to some extent at least, it should be taught in our public schools and a higher training be given in our colleges and universities.

In a recent discussion as to whether domestic science was to be considered a proper subject in a university curriculum it was remarked that "a young lady does not wish to go about with a placard on her back announcing that she is a candidate for matrimony." It is not a question of marriage, it is a question of the well-being of the individual. But many a young girl or woman has been called upon to take charge of her father's home, and the success and happiness of that home have depended upon her ability to discharge well those new duties. A notable example of this is the daughter of a present member of the president's cabinet, who was suddenly called upon to take charge of not only her father's home, but to assume as well, the duties of a cabinet lady.

In the minds of many, the thought of this subject is restricted to the kitchen side of the home economy, and for this reason touches only those women who of necessity must attend to those duties themselves, or those who do them for others. If this were true the study of the subject would still be worthy the thought of even the woman of wealth, that she might direct with ease the performance of these duties, and with knowledge that the health and comfort of those dependent upon her might be maintained. To the woman of limited means a familiarity of the subject is doubly important. She should know how to maintain the health and vigor of her family upon a small outlay of money, that the income of the wage earning part of the household may not all be expended for the daily necessities. It is too often true that ignorance and carelessness upon the part of the housewife keeps the family in poverty that might otherwise be in a condition of prosperity.

At the present time there is almost a famine of house maids. At the same time there are thousands of girls who are flocking to the cities into employments which will require them to be well dressed but which pay such small wages that unless a girl is provided with a home her wages will not procure that which by the greatest stretch of imagination could be called a home and the barest necessities of life. To eke out this hard condition many a girl is tempted to place a price upon her virtue—and falls. A working girl either does not stop to consider that were she a house maid in some good home that the warmth, comfort and daily bread for which she barters her virtue would be hers because of her position aside from her wages, or else she has a false idea that the latter service is beneath her dignity. A knowledge of the subject would dignify it in her mind as well as in fact. A young woman recently enquired in the columns of a woman's journal, "What can I do that is respectable to earn my living?" Doubtless the idea in this young woman's mind was: What can I do that by my outward dress I may proclaim myself to the world a lady and not a wage earner? (A lady in her mind without doubt one who was "not obliged to work.")

No honest workman is ashamed of the badge of his workmanship, but rather takes pride in the result of his labors, and the better knowledge he has of his craft the more pride he takes in his ability and the result of his work.

Shall we not provide places where these girls may receive this much needed education, where the subject may be dignified in their eyes, and so aid in saving their souls and help to solve a most perplexing question for the housewife and mother?

There is a large philanthropic side to this subject of domestic science. It has been stated that in sections where this subject was taught that a cry has gone out from the saloon men to put a stop to it for it was injuring their business. We see, therefore, that when a man is well fed and housed and where his surroundings are pleasant and inviting that he ceases to have the cravings for something strong and exciting and is so kept away from vicious surroundings. We are coming to understand that the material well being of an individual has much to do with his character. Surely these matters command the attention of womankind. They are her business. From maid to mistress they are hers, and certainly no woman can call herself educated until she has given them special study.

I quote the following from Mary A. Livermore in February number of Success, which to my mind is a clear statement of what is involved in Domestic Science:

"As a rule, the worth or worthlessness of home, is the work of woman. 'A man may build a castle or a palace,' says Frances Power Cobbe, 'but, poor creature! be he wise as Solomon, or rich as Crœsus, he can not turn it into a home. No masculine mortal can do that. It is a woman and only a woman —a woman all by herself if she must, or prefers, without any man to help her—who can turn a house into a home.' It requires a very high order of woman to be a good wife, mother, housekeeper and homemaker. She who makes a success in these departments possesses such a combination of admirable qualities, both mental and moral, that, with proper training, she might make a success in any business in life. * * *

"For the mighty reason that the majority of women will always be wives, mothers and homemakers, while the world stands, they should receive the largest, completest and most thorough training for their business. These positions are the most important that women can occupy. The very highest function of a woman is to make a home, and to rear and train a family." * *

"But even when women have technical training they should be reared, as far as possible, as if we were sure they are to be wives, mothers and housekeepers. Few women reach adult life, even when they do not marry, without finding themselves so circumstanced, at times, that a domestic training is inevitable to them. Even when one has means to employ servants, this training is necessary; for a woman can not tell when she is well served unless she knows what good work is. A course in domestic science should be added to the curriculum of every woman's college, and it should stand on equal terms with all the other courses."

The Chairman: Before we proceed further with the program I will have another matter attended to.

Mrs. Grout of Rockford: The ladies of the Domestic Science Association are cordially invited to meet the members of the Federation of Clubs and faculty of the Rockford college at the college on Thursday, from 4:30 to 6:00 o'clock. Miss Kate O'Connor and Mrs. Grout will be at the opera house to conduct the guests.

Ella G. Root: This includes all the ladies from out of town.

Mrs. Grout introduced from the stage by the chairman so that all will know her.

The Chairman: It is 40 years ago that I entered Rockford college as a student, and I know it will be a great pleasure to have you go with me this afternoon. As a young girl I never thought I would be in this place here, but that shows how the years change and what we come to.

REPORT OF THE SECRETARY OF THE ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE.

Mrs. S. Noble King. Bloomington.

The fourth year's work of the Illinois Association of Domestic Science has passed into history, and it may not be amiss to pause a moment and take our bearings, comparing the work that has been accomplished with that which we hope to achieve.

With the new century it started out on broader ground than it had hitherto occupied. It was determined to reach the greatest possible number of women, but the plan of work did not impose the necessity of establishing certain limits to be strictly observed. On the contrary each county has been encouraged to work according to local conditions, but to choose those leaders whose influence might be inspiring.

Of the work accomplished during the past year we may safely say there has been definite gain in many directions.

In a work so new as ours it is not a matter of surprise that it should at first be considered of no special value, but rather as a "fad" whose life would be short.

It is only a few years since the term domestic science was comparatively unknown, and even now, though it is being freely talked about, the impression largely prevails that it simply means cooking. While scientific and hygienic cooking is included in the term, it has a far wider range and deeper significance. Can you mention any phase of life or any experience that touches the life of the human family that is not more or less directly traceable to the influence of some home?

It is the teaching of right ways of living that we mean when we speak of Domestic Science, and we all know that many things are involved in right living besides the use of proper food, necessary as that may be.

The girls of today have a right to a better training for home making than their mothers had, and it is in recognition of this right and in knowledge of the benefits that will result from it that we ask to have this training made a part of the regular course of study in every public school.

The objection is sometimes raised that the studies are now too numerous; but thoughtful educators do not hesitate to say that some branches now taught might be omitted with no loss to the future welfare or happiness of the pupils and their places could be filled with others that would have an influence on every day of their lives and that of their families.

Again, it is urged that this training should begin, if at all, in the high school; but only a small per cent of our girls reach the high school, so that to be effective it should be commenced in the lower grades and carried on through the high school and university.

This is one of the objects for which our organization stands today—the training of girls for home making.

Among the many encouraging features of the year's work, there is still one matter of regret which is that some of the counties have but one meeting a year, and that in connection with the yearly institutes.

Much is lost by this method, in fact little progress can be made and no study can be secured in this way.

It was hoped that at the present meeting every county in the State could be reported in the State organization.

While we are able to welcome 81 out of the 102 counties, as against 68 reported last year, we still feel that our work is not what it should be until the other 21 are enrolled for service.

To effect this lack, many counties have a number of domestic science clubs doing effective work.

Probably the very best plan would be to have these clubs organized according to the limits of the school districts. For obvious reasons there are community relations and mutual interests existing between families living in the same school district and the school house could thus be made what it should be, a social center. With a domestic science club brought within easy reach it would give new zest to many women who now have no opportunity of learning of the beauty and harmony that might be introduced into their homes, for regret it as we may, there are many, many women on the farms of Illinois who have simply a monotonous existence.

To them the club would be a healthful stimulant to wholesome environments. It would teach something of art and science and its application to every day life. They would learn to cultivate the beautiful as well as the useful in all the works of their hands in the home and in the school.

Not the least advantage to be gained by school district clubs would be the acquaintance and mutual sympathy and interest between mothers and teachers, a factor at present not greatly considered.

As report follows report from the various associations or clubs throughout the State, it is evident that the work which was begun with a vague understanding of its scope has developed into a power that is manifested in better sanitation in homes and school rooms; in a cultivation of the beautiful by planting and protecting trees in school yards, and in other ways making the school house and its surroundings correspond to the homes in the district; in a study of child training and the recognition of children's rights and parents' responsibilities; in the ability to select food with a proper estimate of its cost and nutritive value, and also to cook and serve it acceptably and artistically; in the introduction of the teaching of sewing and the elements of housekeeping into some of the rural schools.

These messages mean that the tendency is to pass more from the merely pleasurable to the highly practical ideas of life. It also means that women are learning that good homemaking is not confined to any four walls, but that it is representative of all that teems in the brain, thrills in the heart, or works in the will of womankind.

From the mass of incidents and experiences that has come to the notice of the secretary it is somewhat difficult to select and set in order the salient features of a whole year's work within the limit of time allotted to this report, but we especially wish to mention the new library that has been given to our association by the State Farmers' Institute, which is in the care of the secretary of the Illinois Association of Domestic Science.

The library consists of 120 volumes selected by our association, all on topics pertaining to some feature of home life, such as hygienic cooking, care of the sick, child training, sanitation, decoration, with some psychological studies by great teachers.

These books are free, except charge for postage, to all domestic science associations affiliated with the county institutes, and to all local clubs auxilliary to the association.

These books were not ready for distribution until January, but already a goodly number have been sent out and calls for others are being received almost daily.

The State Association of Domestic Science has been the recipient of most generous treatment from the State Farmers' Institute and in fact it would have been unable to do much that it has done without the timely and very material assistance afforded by that body. It therefore gives us pleasure to voice the hearty thanks of the thousands of women we represent for every courtesy extended to us.

During the past year we issued our annual booklet giving a report of the work of the State Association and very brief reports from the counties. These reports were sent to the officers of the county and local associations and to many others who were known to be interested.

Requests for these reports have come from many states and also from the superintendent of institutes in Canada, who wished to purchase a large number for use in their work. No reports have been sold, but in each case as many copies have been sent as could be spared, it being the policy of the organization to spread the gospel of good living without regard to geographical lines.

The following quotation is from a letter just received from a lady living in Wisconsin who has charge of a home department in an agricultural journal. She says: "I wish to thank you for explaining the work of your association. Of course I am much interested in anything of that character, as my work in the journal is along the same lines. My department stands for the betterment of the home and home life, and that means a larger knowledge of domestic science, sanitation and household economics. It also stands for an uplift of sentiment with regard to household labor and all that pertains to housekeeping and homemaking, and so you will see that we are all working for the same purpose—the uplift of humanity. We have no organization of this kind in Wisconsin, though we have the cooking school affiliated with the Farmers' Institute, but that, of course, does not reach out to the masses as does your organization. I very much wish that we might have some such organization in this state, for I recognize the great good which such conferences may accomplish, and, too, I think it is really significant of the trend of public sentiment toward the betterment of the home.

"If you could kindly send me another report of the Association for 1901 I think I would be able to place it in the hands of a woman who has the leisure to awaken some sort of an interest in an organization in this state."

The fact that the writer is a total stranger to the present secretary and to the other officers gives her words of appreciation added weight. This is only one of many letters received containing words of good cheer and inspiration for future effort.

Among the achievements of the past year is the securing from the trustees of the State University of a free scholarship in the household science department for one young lady from each county in which there is an association of Domestic Science. This free scholarship is good for two years and if, at the end of that time she shall be prepared to do the required work in the preparatory department, the time will be extended four years longer. This, however, does not bar another applicant, as one may be admitted each year from the same county. It will be seen that it is the privilege and duty of each county association to recommend one young lady for a scholarship before the beginning of another school year.

Perhaps the most definite step that has been taken, the most significant feature of the year just passed, was the inauguration of a new phase of the university extension work at our State University.

At the meeting held in Jacksonville a year ago a resolution was enthusiastically passed favoring a short school for housekeepers to be held at the State University at the same time as the Corn Breeders' and Stockmen's convention.

This matter was presented to Professor Davenport, dean of the college of agriculture, and to Miss Bevier and Miss Beatty, teachers in the household science department. They very graciously complied with the request and in their efforts to make it a success were cordially and ably seconded by Dr. Burrill, Dr. Grindley, Dr. Forbes, Professor White, Professor Palmer, and Professor Blair, who won the hearty appreciation of every woman who was privileged to be present. That the women of Illinois are ready for this kind of university extension was proved by the numbers present and also by the following, received from the Secretary of Logan County Institute: "I have several calls for programs for the Housekeepers' Conference; may I have a few?"

An organization was formed and the following is furnished by the secretary of that society:

PHILO, ILL., Feb. 1, 1902.

The Housekeepers' Conference, held in the agricultural building of the University of Illinois Jan. 20-31, elected the following officers: Mrs. Joseph Carter, president; Dr. Alma Braucher of Lincoln, Ill., vice president; Mrs. I. S. Raymond of Philo, secretary.

All of the sessions of the meeting were well attended in spite of heavy snow falls and some zero weather.

The number of ladies from different parts of the State who were in attendance was very encouraging.

Too much can not be said in praise of the program, which was entirely carried out. Everything given was most interesting and helpful, and the discussion brought out many new ideas.

The following resolutions were adopted:

WHEREAS, We, the members of the Housekeepers' Conference, in convention assembled, at the University of Illinois, in January, 1902, desiring to express our appreciation of the great benefits derived from this meeting, do hereby resolve that our thanks are due—

First—To the State Domestic Science Association for the inception and execution of plans for this valuable meeting;

Second—To Dean Davenport for his hearty coöperation;

Third—To Miss Bevier and Miss Beatty for their untiring efforts in our behalf.

Fourth—To those members of the faculty of the University who have given us the results of their best work and research for our instruction.

Resolved, That we hope a similar conference may be held at this place next year.

ALMA E. BRAUCHER,
MRS. KINLEY,
MRS. RAYMOND.
Committee.

The spirit of the meeting is much to be commended.

Those who imparted instruction did so in a most cheerful and kindly manner and all of the ladies were there as students, gladly receiving all facts that could aid them in better home making.

MRS. I. S. RAYMOND, *Secretary.*

A Housekeepers' Conference was a modest name for a meeting so replete with instruction from specialists. It is true, a conference was held each day between the regular sessions, but this was in the nature of a round table where the treasures of experience were exchanged, and much valuable information was gained. The program prepared by Miss Bevier and so fully carried out was an inspiration to women who have left their school days far behind them, and thus were set in motion forces that it is hoped will widen and deepen until every home in this State will be the better for this new work. The topics studied and discussed were topics of every day interest, such as are in force in our homes whether we recognize their importance or not, and it is believed that the Housekeepers' Conference has marked an epoch in the work of the Illinois Association of Domestic Science.

We are now starting out upon the new year with definite aims towards definite ends.

We shall endeavor, with the help of county officers, to place the work of domestic science, in its broadest and fullest significance, before the women and girls of every school district. We have no hobbies, but as a body of home makers and housekeepers the effort to better conditions in the home falls legitimately within our sphere. We are organized for service, not for dormance.

To my associates, whose loyalty, patience and zeal have made the past year's work a beautiful memory, I leave this motto: What we need most is not so much to realize the ideal as to idealize the real.

WHAT THE DEPARTMENT OF HOUSEHOLD SCIENCE OF THE UNIVERSITY CAN DO FOR THE STATE.

[Mrs. Professor J. C. Blair, Urbana.]

There was a time when it was all sufficient to know how to do a thing. The "why" of the investigator had not yet uprooted and overturned the moss grown soil of custom to get at the subsoil of reason, which is sure to be there, buried however deep it may be. (In truth, the weight of this little word caused an upheaval in the world of science and industry whose tremblings will yet be felt for many years and whose consequences no man dares to prophesy.) It is well to know how to do a thing; it is better still to know why it is so done. Our grandmothers did things in the way experimentation proved to be the best. Our grandchildren may do them, perhaps in the same way, yet with that positive touch which evinces a reason back of the performance. The former sought result; the latter will seek cause and learning it will leave effect to follow naturally. A recent edition of one of our magazines says: "It is both the misfortune and the fault of women themselves that so many household processes remain a century behind the times in the light of modern science. 'The girls' mothers should teach them' it is claimed. They should, but even when they do, what do they teach? The lore of the preceding generation, how to cook the same old dishes, not how to study foods and their combination, not the systematic management of a home."

It is probable that a growing desire to know why has been the indirect cause of the establishing of agricultural schools and other colleges of applied science. Going a step farther it is safe to assume that this same investigational fever having attacked womankind is responsible for the Departments of Household Science which are being established one after another from ocean to ocean by both northern and southern routes. (It is not my purpose nor is this the time, to discuss, even briefly, how and why the University of Illinois added to itself such a department. The history of the inception and growth of the movement is well known to all Illinois women—or should be. The selfish question that here arises is, "Now that we have this institution, what can it do for us?" Not for the students in its courses, but for us—the women living in every county of the State far from under the shadow of the University's educational wing. Let me correct that last clause. We, as housekeepers, are now no longer unmothered by that institution. The opening of the department under discussion is a tacit admission that it is the immediate duty of the University to satisfy the needs of one class—either directly or indirectly.) If, as some argue, it is the business of the University to train teachers only, who in turn are to teach in the secondary schools, then our help must come through these secondary schools; but if, on the other hand, the University's educational policy is "whosoever will," then we have a right to expect direct satisfaction for our thirst after knowledge. If I am not misinformed, the latter is more nearly the policy of this particular department—if not of the entire University—although neither scheme may be a hindrance to the other. Then what can be done for us as housekeepers? One of us lives in Stephenson county, another in Calhoun, a third in Pope—in each one of the 102 counties are those who realize their need of some more perfect guide to the solution of household problems than their untrained minds can devise. Our question, "What can you do for us?" will be met by another, "What do you need? Not what do you want, but what do you need?" What is it we need? Some one to tell us how she makes bread; some one to say, "I apportion my income in this way to cover my various household expenditures; I would drape a north room with some warm tint?" Never a bit of it. It is upon an underpinning of sound principles that housework as well as manhood must be based. Some of us may need to know the principles that underly or govern successful bread making. It is not the business of Miss Bevier and Miss Beatty to teach this woman how they themselves would make the bread. What she should know is why certain conditions of yeast and sponge result in certain ways. Let her apply the principles to her own recipe. Of course there are some of us—more's the pity—who, knowing the principles, could not make application of them. Verily, for such there is no help. It can only be hoped that they are not sufficiently numerous to discourage that great host of womankind who are being made better, broader and nobler by the knowledge which they not only have but know how to use.

But since housekeepers' needs are about as numerous as housekeepers themselves, and about as dissimilar, it will probably contribute to the brevity of this paper to consider some of the definite ways in which such a department may do the most good to the greatest number.

In order to learn just what value such departments set upon their own work, I ventured to ask an instructor in each of several representative schools of domestic science to state briefly for me just what she felt that she and her assistants were doing for the uplifting of household affairs. The replies were probably as characteristic of the schools as of the women who represented them in replying to me.

One most efficient teacher of household science stated the value of her department briefly, thus:

"First—The fact of such a course in such an institution dignifies the subjects taught, and causes them to be more highly esteemed by those who do not appreciate the dignity of housework.

"Second—It makes a center of intelligence, and aids greatly in diffusing scientific facts and overcoming the bad effects of superstition, fads and fancies respecting home management.

"Third—It provides a place for fathers and mothers to send their daughters, if anxious that they should grow up to be good homebodies."

Another instructor mentioned the articles contributed to local and general press, bulletins, annual conferences, and greatest of all, the widespreading circles of influence emanating from those students who have worked in the departments of household science.

Another describes the working of a reading course under the direction of such a department, mentioned the public addresses made by the instructors, also a winter short course in household economics, probably on the order of the farmers' short course, which was formerly conducted by the college of agriculture in our own State.

Another instructor, well known for broad training and high ideals, gave perhaps the fullest and most correct statement of values when she said: "A department of household science should stand, first, for the symmetrical training of women on a basis of science, thereby securing accuracy, thoroughness and breadth of view. Secondly, such a department should afford woman the benefits of applied science in her own field of labors, the easiest place to practice it being in the kitchen and other departments of the home. There has been a substantial change of ideals in the education of women. Colleges for men long since recognized the value of science and its applications. Is there any good reason why the girl should not apply her knowledge of chemistry to bread, and of bacteriology to the processes of fermentation?" Speaking further on the value of such a department to the State she said: "I believe that the most direct benefit which we as a department can give to the outlying sections of the State is that which goes by way of the students whom we train. There is no way to measure the improvement which will result from the influence of a few earnest girls who go home after a thorough training in the household sciences."

Perhaps from each such institution might come a wholly different statement of values. Does this lessen the value of any one or all? By no means. What it does do is to indicate the scope of the field to be covered, the great variety of the problems to be dealt with. Let me go over the ground in greater detail. First and last and all the time, the workers in the department of household science are to stand between us, who may be and probably are untrained along scientific lines, and the sciences themselves. They are, in fact, to act as a medium of communication between us and science; to be interpreters to us of her unfamiliar language. They can do this in many ways, probably most frequently by publications, in bulletin form or otherwise, although demonstrations, conferences, student influence and personal contact will serve as a means of putting us into intelligible intercourse with the household sciences. To be more explicit still—if we need more light on the chemistry of our foods, the hygiene of the house, the body, or sanitation in general, systems of sewerage, household decorations, dietetics, physiological chemistry—investigation along these lines and many more makes up the work of the department, and information will be given to those who desire it.

Each of the instructors interrogated seemed inclined to place special stress upon the value to the State of student influence. In order that we as housekeepers may know whether these students are being fitted along lines that will benefit us, it may be well to examine the course of study offered them by the department. Quoting directly from the catalogue, we find the following five courses of lectures prepared for the student, and it is safe to assume that as demands for others arise they will be added:

"Course 1. Principles of the Selection and Preparation of Food—In this course the nature and the uses of food are considered; its chemical composition; changes effected by heat, cold or fermentation. Practical application of the principles of selection are given by marketing expeditions. Some of the processes of the manufacture of food are considered, as well as the combinations of different kinds.

"Course 2. Home Sanitation.—This course treats of the situation and surroundings of the house; the relation of soil to health; heating, lighting, ventilation; water supply and drainage. Furnishings from a sanitary and artistic standpoint, and some of the principles of home management are considered.

"Course 3. Elementary Household Decoration.—Topics considered: The evolution of the house; homes of primitive peoples; finishing, furnishing and decoration of modern American houses. Lectures, reference work and discussions.

"Course 4. Chemistry of Food and Nutrition.—This course deals with the subjects of food and nutrition from the standpoint of sanitary and physiological chemistry. The student is expected to make investigation in the study of yeast fermentation: various household applications of bacteriology; to construct dietaries adapted to different ages, occupations and conditions.

"Course 5. Hygiene and Dietetics.—This course is a continuation of Course 1. It treats of the relations of food to health; of the adaptation of the diet to abnormal conditions of the body, and includes the working out of dietaries suited to the needs of the average family.

A recent departure of incalculable value, termed the Housekeeper's Conference, was in session at the University during the last two weeks of January. It was conducted in the department's own home, and probably occasioned little more preparation than the reception of guests in the private home. However, I should let the hostesses discuss this matter. But I wonder if in the years to come the benefit derived from this fortnight's interruption of regular department work will not be infinitely greater than that accruing from the same period of merely routine proceedings. Who can tell what harvests may spring up from the seeds sown during the Housekeepers' Conference? It may even be well that such a gathering of representative women of the State should become an annual event in the Department of Household Science. It would seem fitting, too, that the upper class girls present one or more of the programs.

The department of household science can not know, except in a general way, the needs of a woman in Jo Daviess, or Henry, or even in Champaign county, unless she makes them known, and this she will probably not do, at least not to any one quite so remote as the professors in the State University seem to be. Evidently another go-between is needed. Between the women of the State of Illinois and the department of household science of the State University stands the Illinois Association of Domestic Science. It is the official organization of the housekeepers of the State, created by yourselves for just such a function as this, and as an association it has a great work to do, a work which no one else can do for it. Its business is to find out what the women of the State stand most in need of, then to present these problems to the department, which stands ready to work them out so far as time and equipment will permit. The housekeepers of the State need this society, the society needs the hearty support of the department of household science, which in turn rests upon the other two, and neither can exist in perfect symmetry without the other.

The Chairman: At the dedicatory ceremonies of the Household Science department of the State University we had with us a woman sent by the British government to study domestic science and hygiene in our schools and universities. She made a very interesting address to us and told us of the work they had been doing. They have been working along this line very much longer than we have, and Mrs. Bills was to report on the address of Mrs. Ravenhill this afternoon, but unfortunately she is sick; but we have her paper and we have a lady from Philadelphia to read it. Mrs. Rorer will read the paper.

LADIES AND GENTLEMEN—I shall do the best I can to read the paper and interpret it for her.

To give a correct report of the dedication of the Household Science Department in the University, I shall have to go back in order to begin.

This subject was many times discussed before its establishment in the University, and was ardently supported by the Illinois Federation of Women's Clubs, women's trustees of the University and president and vice president of this association, but none were successful in their efforts to bring about the desired result, although the work of Mrs. Carter and Mrs. Dunlap was untiring in this direction, so it remained for the State Association of Domestic Science to further the interests of the cause and bring about its victory. In February, 1900, when the association held its second annual meeting in connection with the Farmers' Institute at Mount Vernon, resolutions were adopted requesting the board of trustees of the University to make provision in connection with the college of agriculture for a complete course of instruction in lines of study pertaining to domestic science and household economy. This resolution was ratified by the Farmers' Institute and presented to the board of trustees at their March meeting, at which time they voted to establish such a department, and in the following September a course of Household Science was open for the young women of Illinois. For the time being a temporary place was given the department in the natural history building, but as conveniences were few, little was accomplished the first year except to become thoroughly established for work in earnest the next year, where in the agricultural building they were to be permanently located. This building, on the 21st day of May, 1901, was dedicated amid a downpour of rain which thoroughly demonstrated the fact that there is more water than land in the universe. During the course of construction the building was watched with much interest, not only by those of the college of agriculture, but by those of the department of Household Science as well. Already this branch of learning established during the first semester was well under headway, gaining rapidly in popularity and numbers, meeting with more than ordinary success and creating among the students a deeper interest for a practical knowledge. Under such auspicious conditions the Household Science department of the college of agriculture was dedicated. Morrow hall of the new building handsomely decorated with palms and blooming plants from the University conservatories, presented a cheerful and inviting appearance and gave cordial welcome to the many friends of domestic science, both local and foreign. Among those taking part in the ceremonies were Miss Jayne, dean of women in the University, Mrs. Norton of the Chicago Institute, Miss Hunt of Lewis Institute, Chicago, Mrs. Kedzie, Bradley Institute, Peoria, and Miss Ravenhill of Bradford, England. Miss Jayne opened the program by introducing Miss Ravenhill, who proved a most interesting and practical speaker, as was evinced by the fact that she held her audience for over an hour telling of domestic science in England. Miss Ravenhill was sent by the British government to investigate this science in the universities, colleges and public schools of our land. She visited Illinois at this time and was invited to assist in the opening of the Domestic Science school which was coming into possession of a permanent home. In this new building it was to settle down to the performance of its part in the great educational work which the University was carrying forward in such a splendid diversity of lines. To hear of England's system of work from so pleasant a speaker gave special interest to the ceremonies and added much to the pleasure of the occasion. Miss Ravenhill was warmly greeted and favorably impressed her hearers with her smooth flow of language, witty remarks and original English style. In appearance she was much like the average American woman, perhaps not quite as good looking, but she was sharp and bright, and one peculiar characteristic I can not refrain from mentioning, which represents so forcibly the vain qualities of the English as well as the American woman, is that she always wore her hat. Can you recall one who does not thoroughly enjoy wearing a new one? Miss Ravenhill was no exception to the rule, but in her case this may be accounted for in two ways—one as the most convenient, or was it most becoming? You may decide for yourselves which of the two reasons is the most plausible. While education in this science is much older in England than in this country, it is more practical, the theories of sanitation and hygiene, the food values and the physical requirements of food elements receive little attention. In her work among the schools of Yorkshire, where Miss Ravenhill is official inspector of schools, she has discovered a great degeneracy physically among the working classes; a great increase in infants' deaths and lack of physical strength in both men and women of that class. Her belief is that it is lack of scientific knowledge of simple food values, sanitation and hygiene that is responsible for this evident degeneracy. The term hygiene which is too often limited to its purely theoretical or personal meaning is used in a much broader sense in England than in America. It deals with the principals of both personal and public health, in an essentially practical manner. Experiments, observations and demonstrations which assist in applying such principles are required that they may be able to look at the health question with intelligent eyes and recognize its existence and importance in their own ordinary surroundings.

In London they have what is called "housewifery centers." Homes are selected and by consent of the housewife a certain number of girls take entire charge of the house for a period of about two weeks; they are taught all that pertains to housework, such as cleaning, cooking, sanitation and ventilation. This system is of great benefit to the housekeeper, though perhaps at first it might be annoying, but there is so much to be gained in knowing the right way to do work that the trouble should not be considered. I am not wholly prepared to admit that for the American housekeeper this plan of housewifery centers would be the most satisfactory way of conducting such a school, yet the advantage to the student in a practical way could not be improved upon. Such a course not only prepares the student for homemaking, but if needs be, qualifies her for a position of some domestic character that would bring immediate results, while many of our girl graduates are prepared for neither. I imagine an English housewife would smile at our newly made housekeeper when she makes coffee from the parched berry or compares in size the sheep and the beef, ordering for dinner a leg of the latter for a family of two. A story is told of the Ormandizer family who lived where shell oysters were plentiful. Mr. Ormandizer struggling to carve the first turkey his wife ever cooked, mentioned in rather a disturbed way that the bones in the fowl were thicker than a shad's. Mrs. Ormandizer almost crying with anxiety, informed him he must be cutting against the shells. Shells, said Mr. Ormandizer. Yes, John. Don't you remember you asked me to stuff the turkey with oysters. These are a few of the many experiences of the new housekeeper.

While other centers are being established in England there is still another place for rural district work. The county council employs teachers whom they equip with things necessary to carry on what is called peripatetic work. Such a teacher visits the rural schools, giving a six weeks course in cooking, sewing, etc. At the close of this course she takes her equipment in a cart to the next school, and so on until she has visited all schools within the district. In the board schools of England cookery, needle work, laundry work, dressmaking, home nursing, millinery and domestic economy are taught. Every girl receiving such instruction between the ages of 11 and 14 years. All are taught sewing, it being obligatory in all grades of the elementary schools. In private schools, attended mostly by the wealthy class, domestic economy is frequently omitted, but even this fact does not always prevent those of title from improving such advantages as the country affords, for I am told by a South Kensington graduate that a great per cent of the wealthier classes take a domestic course for the purpose of learning how to supervise their own households. Whether they are ever called upon to take charge of one or not, they know how everything pertaining to housekeeping should be done. Perhaps some such method might be the means of solving the domestic problem which today is disturbing the peace of the American housekeeper. William Morris says, "Anybody can learn mathematics, but it takes a lot of skill to manage a house well. In comparing our domestic science with that of England, though 25 years behind in some respects, we are gaining fast in all directions, first by forming household clubs or associations all over the State and arousing an interest that is being felt in the public schools and in the universities. Applied sciences give us great advantage over the English system. Miss Ravenhill was much impressed with the advancement in this direction and in her report to the English government added an appendix of an ideal school, from kindergarten through the University. Of the four western universities she visited the household science course of the University of Illinois was recommended in this report, being much in advance of all others.

At the close of her address Miss Bevier, dean of the household department of University, in a very happy and pleasing manner told how they had lived with carpenter and plumber for months in anticipation of the day and although not yet fully equipped in every degree, what had been accomplished was highly satisfactory. She invited those present to inspect the rooms devoted to the department with the understanding that it was yet incomplete, but hoped they could perceive from present conditions of what might be accomplished when everything contemplated by the legislative appropriation had been realized. At this conclusion the audience was invited to accompany Miss Bevier to the household science rooms in another wing of the building. It was a nice thought which prompted her to request the audience to follow as the way thereto was intricate and confusing; some not heeding the advice were lost by the wayside, finding themselves in the dairy, stock judging rooms or astray altogether. Through long corridors and up several flights of stairs, we came to the bright, cheerful reception hall, furnished much like that of a modern home, but on a much more extensive scale. The office of Miss Bevier was made attractive by pictures, drapings and pieces of art, suggestive ideas of artistic house decorations. Here the receiving party greeted the many friends and we passed on to the laboratory, which furnished much in itself to interest many, while the students took special delight in explaining such appliances as were not understood. The kitchen formed no little point of interest and shared its part of praise—tables complete with utensils and gas burners for demonstrations for each student in addition to a large gas range, sink and charts about completed the furnishings. All these made the kitchen resemble that of the home and yet made it answer admirably every purpose and requirement of the course.

After a refreshing ice, in place of the social cup of tea, served by the young ladies of the department in the class rooms, the formal dedication of the household science school was declared at an end; yet not at an end in the minds of those who realized the beginning of such an important feature in connection with the University of Illinois. The duty of the department will be to throw light on the most reasonable and rational methods of sustaining the physical being of men and women of this great commonwealth.

To their great opportunities for civil liberty and happiness, if we add the advantages of being sensibly and healthfully fed, clothed and housed, it is not easy to conceive what more the people of the great prairie state could wish.

Perhaps you will be interested to know that Miss Ravenhill is very English in believing they have things better over there, but we are not such a slow people, and we will catch up if we have the help of the Farmers' Institute. We are working for domestic science in the public schools and universities and we expect the help from every gentleman here.

This is the first program we have planned without a gentleman, but we find it is quite necessary to have a gentleman upon it. We have with us Senator Dunlap, chairman of the Illinois Commission at the St. Louis fair.

SENATOR DUNLAP: Ladies and Gentlemen of the Farmers' Institute—I did not expect to appear before you to address an audience this afternoon and I do not now intend to do so. I am here, as they used to say in the old debating societies—the boys used to go out before the audience with our knees trembling and having all the ideas in our brain down in our feet—we used to say, "Mr. President, I will leave the floor to a more able speaker." I am interested in the work that you are undertaking here as the Domestic Science Association, and we have in mind a little scheme in connection with the reputation of Illinois at St. Louis in 1903 and in which, if it is possible, you are more interested than we are, or fully as much so at least, and we have with us the chairman of the committee on agriculture, a gentleman who will talk to you about this scheme we have in mind, and I will not take up your time, which I know is fully occupied, but I will take pleasure in introducing to you Mr. Sprague of Galesburg, the chairman of the Illinois Commission.

Mr. Sprague: Mr. Chairman, Ladies and Gentlemen—I can only talk a few moments. I didn't expect to be aksed to say anything at all. I am not very much of a speaker. I am a practical farmer like a good many of you.

When this commission was appointed it was found there weren't but three farmers on the commission. One claimed he was a farmer. He couldn't give any exact information—claimed he was born between two rows of corn—and we elected him as chairman of the committee on live stock, and the other farmer, Senator Dunlap, we elected as president, and the hardworking position devolved upon me, chairman of the committee on agriculture.

As to any scheme we have, unfortunately the commission from this State has not been able to get the board of general managers to give us any definite plan as to what we will be able to do in furnishing an agriculture exhibit. I have been trying to get definite plans from them and so far I have not succeeded, so I will not be able to give any details of what will be exhibited. We have concluded, however, that we will work in this matter entirely through the State Farmers' Institute and through the various county institutes of this State. We believe that that is the greatest educational institution in which the people of this State and the farmers are interested today, and we believe more good can come through the proper attendance of these institutes than through anything else, so we have been in correspondence with the officers of the various county institutes, and our idea will be, and the general scheme would be, to give them an agricultural exhibit, or an exhibit of agricultural products of the State of Illinois along a little different line from any agricultural exhibit that has ever been given before.

We propose to take the various products of this State and illustrate as far as we are able the growth and development of those products. We propose to show the poorest specimen of corn, show the original, primeval corn from South America, show the various products developed from the poorest to the best products raised today, and pursue the same scheme with other products, and uses of the food products, except, perhaps we may omit the liquid element of corn. That will take care of itself in other quarters and as members of the commission we don't know much about that anyway. We will have an exhibit from this State that will be an education to everyone who sees it, and we believe the Farmers' Institute and the officers and people interested in the work throughout the State will agree that we have an exhibit that will be worth seeing and one in which everyone can learn, farmers as well as anyone else, and we hope, ladies and gentlemen, you will coöperate with us and help make the exhibit from Illinois the best from any agricultural state. It has been said, with some degree of truth that some states have excelled Illinois in the quantity and quality of certain agricultural products. If that is true it is the fault of the people of Illinois and we must remedy it, and through our exhibit we will show that Illinois can raise the best and most of anything that can be raised upon the farm.

Music, vocal solo, "Love's Sorrow"—Mrs. O. R. Brouse.

We have with us this afternoon Mrs. Virginia Meredith, professor of household economics at the University of Minnesota. She is more than this; she is a farmer, a large farmer herself, and a stockbreeder, also.

HOME ECONOMICS.

Mrs. Virginia C. Meredith: It is a great pleasure to attend the Farmers' Institute, and it was with the greatest selfrestraint that I refrained this morning from attending the meeting of the stock breeders. That is where my heart is, as I am a breeder of livestock, but nearer to my heart is the subject of the home, especially the farm home.

The glory of the United States is its detached home, a home wherein each family may pursue its own ideals. A new thought is finding lodgment in the minds of earnest people, a new thought about the home itself, and especially about the preparation or training that ought to be given to women who organize and maintain homes. The home is the most expensive institution in existence, and we have a right to expect, a right to demand much of it before we justify its existence. It would be far cheaper for people to live in communities of 100 or 1,000, as they do in asylums, where one buyer of food, furniture and clothing could have the advantages of wholesale rates; where one cook could cook large quantities of food with one fire, where many rooms could be heated from a central plant. This would be the cheap plan, but it is not the economical plan if we have in view the rearing of fine men and useful women. "The home exists," says Mrs. Richards, "for the protection of child life." And indeed nothing less than the opportunity it offers for the right development of the child (which is the hope of the race) will justify the expensive institution we name home. Any discussion of the subject of home economics must, in my opinion, rest upon four propositions, which in some degree define the subject:

First—Home is a place and an opportunity for the right development of the physical and spiritual natures.

Second—The organization and maintenance of a home is primarily and perpetually a personal enterprise; that is, its nature is such that homes can not be organized successfully by syndicates.

Third—Housekeeping and homemaking are so intimately related that they can scarcely be separated, and together they form a business more important than, and probably as difficult as any business known to modern times.

Fourth—The one who would carry on this important and difficult business deserves and should demand adequate preparation, training and education for this special business.

It has been said that masculine economics uses men to the end of creating great wealth, while the feminine economics uses wealth to the end of creating great men. It is undoubtedly true that men earn money and women spend it. Who will say which is the more difficult achievement from the economic standpoint? I use the word economic as meaning wise use. Men have been and are being helped in every way possible to earn the dollar. Science, invention, system, have been wisely used; technical schools in medicine, engineering, bookkeeping, and everything else under the sun help the man to use his powers wisely in earning the dollar. The value of the dollar which the man earns is determined by the intelligence of the woman who spends that dollar. What education or training is given the woman to enable her to spend the dollar wisely, economically? With the exception of a very, very small per cent that constitute the "savings," all the dollars directly earned in these United States today are spent in and for the homes of our country. One may say: "Yes, but women do not make the expenditure." Some thought will modify that assertion. It is the woman's intelligence, her knowledge, taste, ambition, that largely determine the scale of living in her family; if she decides to have hot buscuit seven days in the week, the expenditure for flour, lard, baking powder, fuel, will represent a sum quite different than if she elects to have yeast bread. Her knowledge of bread-making will modify the cost of living, for it will mean perhaps 20 per cent uneaten and consigned as scraps to the garbage pail. Much the same is true of her intelligence in choosing fabrics that are durable. Every household must have table and bed linen, clothing and carpets. The woman buys, that is, chooses, these things, and her intelligence determines the value of the purchase. Each one may pursue the subject closely in all its avenues and come back at last to assent to the proposition that the intelligence of the woman who spends it determines the value of the dollar which the man has earned.

With this truth, then, acknowledged, what are you doing to educate your daughter for her responsibility in maintaining a home that shall be a place and an opportunity for the right development of the physical and spiritual nature? A place where a dollar shall buy opportunities for culture as well as suitable food and shelter? A place where a dollar shall have its very greatest value secured? It is a mistake to think that all thought of money is sordid; rather, is it not true that right thinking about the use of money involves the best kind of sentiment?

The hope for securing an education for the daughter along the lines of home economics will find its earliest realization, I think, in the agricultural college. There is a wonderful likeness between the education suited for the farmer and that suited for the homemaker. It has taken a long time to formulate a course of study that combines in a rational way the theory and practice of agriculture. The men who have already mastered this problem are the ones who can best master the newer ones. They can meet the prejudices that always assail a new departure. Those who said that the farmer can teach his son to plow are the first to say that the mother can teach her daughter to cook. Little help and great hindrance must be expected from those who entertain such poverty-stricken conceptions of farming as to believe that plowing is the entire busines, or such poverty-stricken conceptions of home as to think that cooking constitutes its importance. These two difficult subjects, agriculture and homemaking, can be most successfully taught by trained teachers. You send your son to school to be taught to read, not because you do not yourself know how to read, but because you are carrying on an absorbing business and rightly think a trained teacher can give your boy the very best instruction. The mother who is keeping house and making a home is fully occupied and can not undertake the orderly teaching of home economics, and moreover, more's the pity, there are many, many mothers who are themselves untaught.

I believe that home economy can be taught along with the other studies in the schools if we had the right kind of teachers. Take for example, in physiology the student learns a great many things and among these things it learns that the skin is an organ of excretion. Now what does that determine in relation to the home? In the first place it determines that a bath once in a while is a good thing. It determines also that one should not wear at night any clothing worn during the day. It determines also that the bed room must be well ventilated. When we are asleep we can not change conditions. The system is relaxed and so the matter of sleep comes into consideration. What is sleep? Who can say what it is? We used to think it a physical exercise, because the body was tired. The heart and lungs work constantly and the lazy man sleeps longer than anybody else. So, therefore, we got new ideas about sleep. There are those who say sleep is a spiritual exercise. That we must retire from the wicked world for one-third of the time in order that the spirit may be renewed. The mind and not the body is the first thing hurt when one does not sleep. So all this comes back to the one fact in physiology. Did the teacher in physiology follow it up? Certainly not, but following its application and use in home life we shall find it a very pertinent influence in the every day things. I think the fact determines a great deal more. I think it determines the kind of a house we are going to live in if this body, this skin, is an organ of excretion. We want to air our bed in the sunlight and are going to have a dainty home full of untainted air. One ought not to be discouraged when we think how 25 or 50 years ago that all education was classical and because so much now is scientific. We should not despair about having the every day things brought into instruction. The whole value of science is its application to affairs of every day life. And why not bring it right into the home?

I also think with a great deal of pleasure of something I read of Kate Douglass Wiggin in which she speaks of the violin and says that the violin is made of wood—maple or other selected wood—so much from the sunny side of the tree and so much towards the heart of the tree. The wood that has heard the singing of the birds, the rustle of the leaves, the music of the insect and all the sweet things of nature. After selecting it it is put in water in a stream that gurgles and ripples around it, and then the man who has selected it puts the wood away to lay for eighty or a hundred years when another makes the violin, and with bits of ivory and metal fashions an instrument and calls it good. And yet so carefully fashioned this violin is nothing unless touched by a master hand. We make a home; all the material things come into the house, and yet there is something more. The home is the place for physical development and also the place for spiritual development. Ruskin says: In the pathway of every good woman flowers spring up. They spring up behind her, not before her.

You remember the words on the inscription at the Columbian exposition: To the brave men who amid peril discovered this country. To the brave women who in solitude, amid strange things made home. Strange perils, strange dangers, heavy toil made their home. Now no home can be made without the deepest study, and if we would have things better, if we would have more homes that are a place and opportunity for the right development of the physical and spiritual nature, we should learn to fit our women well for such a great career as home making.

THURSDAY EVENING—7:00 O'CLOCK.

The evening session was devoted to educational interests and was in charge of O. J. Kern, county superintendent of schools of Winnebago county.

Music—Rockford High School Orchestra.

Song, "Winnebago"—Pupils of districts 46, 58, 61, 68, 69, 70, 71, 107, 113 and 202, led by Mr. Geo. Smith, instructor in music, Winnebago county district schools.

Illustrated Talk on Illinois Pupils' Reading Circle—Master Rea Frisbie, district No. 71.

Our parents like to tell us of the days when they went to school, in the "good old times." But we are glad we are living in a time when school libraries are plentiful. It is one of our rights to have the help of good books. They give us something good to think about.

With the help of teachers, parents and directors, we are trying to put a library into every district school in Winnebago county. During last school year 2,180 volumes were added to the district libraries, The directors expended $480.34 from the school funds, while the teachers and pupils, by socials held once during the year, raised $868.68. On June 30, 1901, there were 14 districts in the county that did not have a single library book. We hope the children of those districts will have books before this school year ends.

We are putting in the books of the Illinois Pupils' Reading Circle as a beginning of our school libraries. Last year 94 districts put in the books. This year so far — districts have put in the books for 1901-2. The books, 20 in number, like the set you see here on the table, are suitable for all the grades and are selected with great care. Professor Freeman, assistant State superintendent of Illinois, is president of the board of directors and Superintendent Kendall is secretary and manager for the State.

Each teacher is manager for her school and is responsible to the county superintendent, who is manager for the county. Our county manager insists that the reading shall not interfere with our regular school work. We are enrolled as members of the circle by having our names written on a certificate, like this. As soon as we have satisfied our teachers that we have read one of the books it is recorded on the back and in June the county superintendent calls for all the certificates and gives diplomas in return. If a pupil reads six books a diploma like this is given. If two books more are read, a green seal is put on; if two more, a blue one; if two more, a red one; and if the four books of the advanced class are read, a gilt seal is given.

Last year at our first union graduation exercises 1,065 diplomas were given, with about 650 green, 150 blue, 100 red and 60 gilt ones. Last year no school began reading till after Jan. 1, 1901. This year several schools had no books in September, while 50 schools had them before Jan. 1, 1902. By getting them early in the school year we have plenty of time for reading before the graduation exercises in June.

There is not time to tell about all the books. This one, "The Making of Illinois," is a history of our own State from the time of the earliest French explorers. This one, "Side Lights on American History," has good chapters on secession, the battle of Gettysburg, causes of northern success, a century of tariff legislation, and the Spanish war. This book is helpful for seventh and eighth grade history work. This book, "Prairie Schooner," tells about Abraham Lincoln and the Black Hawk war. The true story of a boy who won his education is told in this book, "From Cattle Ranch to College." This book, "Millet," is one of the Riverside art series and tells about the great French painter and his pictures, "The Gleaners," "Going to Work," "The Potato Planters," "The Sower," "The Angelus." This last picture, "The Angelus," sometime after Millet's death sold for over $180,000. With this book begins art education for us, and when we children become men and women we will believe in beautiful pictures for the schoolroom and home.

District School Traveling Libraries—Wilford Johns, District 46:

We think that Winnebago county has the first district school traveling library. That is, boxes of books going from one district to another. Other counties have county circulating libraries from which teachers and school children may get books for a certain time, but boxes like this one traveling from district to district gives all the teachers and pupils an equal chance, both those who live near Rockford, and those who live 20 miles away.

We now have 40 boxes, containing 1,392 books, at a cost of $600. This fund was raised in this way: Three hundred dollars of it was given by the Winnebago county board of supervisors by a unanimous vote at the meeting in June, 1901. The other $300 was raised as the net proceeds of our first union graduation exercises held in nine different places in the county last June. Ten cents admission was charged for all persons over 6 years old. The net proceeds helped to buy the books, At these exercises diplomas were given to those of the eighth grade who had passed the examination for the high school. Also reading circle diplomas were given to children of all grades who had finished the reading, and certificates were given to the teachers for work done.

The exercises were held in nine different places, and we think the superintendent expects to hold them in every one of the 16 townships this year. We thus hope to increase our library fund and to add new boxes for the beginning of the new school year.

The books bought are supplementary readers, books on U. S. history, geography and nature study or beginnings in science, as books on animal and plant life. They are helps in every day school work. In a city a boy gets a chance to read two or three books before going into a higher reader. These supplementary readers are furnished by the city and loaned to the children. The average district school does not do this, and sometimes our folks think that one book will do for all the children of the family. So the supplementary readers help us to do better work before we go to a higher grade.

In this box here are one primer for the primary, four first readers, four second, four third and four fourth readers. For history work in the different grades, here are Baldwin's "Fifty Famous Stories Retold," Cody's "Famous American Writers," Fiske's "History of the United States," Pratt's "America's Story for America's Children," and Thwaite's "The Colonies." For nature study here are "Plant Life" by Bass, Dana's "Plants and Their Children," Grinnell's "Our Feathered Friends," Kelly's "Stories of Our Shy Neighbors," Andrew's "The Stories Mother Nature Told Her Children," and Miller's "First Book on Birds."

We are glad that the school children of Rockford have such a good public library and we hope the time is not far distant when the farmers will believe that a good library should be in every township.

Piano solo, "Melaine" C. Bohm, Op. 278—Paul Schad, District 113.

School Room Decoration in Winnebago County Schools (with pictures from school rooms)—Lillian Remsburg, District 69:

In a recent article on the Mission of Art appeared these words: "The power of seeing and appreciating the beautiful, lifts life out of the common place into the ideal, and brings compensation for the trials and anxieties of this work-a-day world. It is a blessing which carries with it no sting and leaves behind it no regret."

The artist who has learned to express beauty in language or music or on canvass is a prophet whose mission is to call the people to a richer and sweeter experience.

If the people beautify the walls of their homes to make them attractive and pleasant for their family and friends they ought also to take interest in the decoration of the schoolroom where their children spend the greater part of their youth. All beautiful things have a refining influence and it ought to be the aim of every parent to cultivate refinement in his child.

It is not only necessary that they should know how to read, write, cipher, etc., but they should understand how to appreciate all good, true and beautiful things. Then why not begin in the school room by having it pleasing to the pupils? Have the woodwork of some restful color, then decorate the walls to harmonize with it. Then place on the walls appropriate pictures and casts. The picture itself must be a thing of beauty or it has no permanent place upon the school room walls.

The first picture we will look at is Sir Galahad. He is standing by his horse on the edge of a half tamed forest. His face is serious, calm, firm and beautiful. The idea of knighthood has a fascination for all boys and girls, and Sir Galahad stands for the ideal knight, pure of heart and strong of purpose. Who could look at this picture and not be truer and nobler? Perhaps deep into some boy's heart will sink the words, "My strength is as the strength of ten because my heart is pure."

The second picture is the Coliseum. This building is one of the greatest pieces of Roman architecture. It was begun by Vespasian and finished by Titus in 80 A. D. A picture of this building will always be enjoyed perhaps because it was built in—

"The elder days of art
When builders wrought with minutest care
Each minute and unseen part."

The next picture is "The Return to the Farm," and is a bit of French country life and was painted by Constant Troyan. The picture represents the sun as steadily sinking and the cattle and sheep returning home from the meadows where they have been feeding all day. The artist is one of the greatest French painters of landscapes and animals.

The last picture is the "Minute Man." This statue was erected in honor of the minute men who fought at the battle of Concord and Lexington and was erected on the spot where the battle was fought. On it are inscribed these words:

"By the rude bridge that arched the flood,
Their flag to April's breeze unfurled,
Here once the embattled farmers stood
And fired the shot heard 'round the world."

He stands with one hand on the plow and in his other hand is his gun. Longfellow says, "A picture is a poem without words, and this is a story of prompt obedience and absolute devotion to duty."

There has been a great improvement in many of the country schools in the last two years, and the parents as well as the pupils ought to be grateful to the county superintendent and teachers who are working hard to bring the district schools to the standard of the city schools. Yours is the privilege and the duty of cultivating the taste of children by placing before them these beautiful things.

School Room Decoration—Hattie Kingsbury, District No. 202:

If parents try to make the home pleasant for the children why should not some attention be paid to the school rooms where the children spend several years of the best part of their youth? Surroundings have much to do with the making of character. It used to be that a bright picture advertising Johnson's axle grease or pure cider vinegar was thought to be good art eduuation for the children of the district schools. There is no reason why the school room of the country school should not be as pleasant and beautiful as that of the city school.

Teachers and pupils of the country schools are taking the matter of school room decoration into their own hands, By means of socials, cleaning school houses, etc., some money is being raised each year with which to purchase some of the reproductions of the great paintings.

We pupils are studying pictures with our teachers and we feel quite sure that when the present children become school officers they will want a healthful, well-ventilated, well-decorated school room.

This first picture is "Pilgrim Exiles" by Boughton. It represents three pilgrims standing on a bleak New England coast gazing across the ocean toward their old home. This picture is helpful in our history work. We can see the bare and rocky coast of their new home and from the expression of their faces get something of an idea of the sacrifice they made and the suffering they are enduring in their voluntary exile from home.

"I have been thinking all day" said gently the Puritan maiden "Dreaming all night, and thinking all day of the hedge rows of England,

Still my heart is so sad, that I wish myself back in old England,
You will say it is wrong but I cannot help it."

This next picture is the well known one of Mt. Vernon the home and resting place of Washington. The portraits, good ones of great Americans and their homes must have a good influence upon growing youth.

This third picture is "The Shepherdess" A scene from peasant life by Lerolle, a French painter. Country life is so different in Europe from that in America. In the distance we see the home while in the foreground the young women leads the sheep to pasture. Behind the clump of trees is a farmer plowing.

This last picture is the celebrated "Horse Fair" by Rosa Bonheur. It took a year and a half to paint it. Stranhan says of it "solid and firm odelling, accuracy of action rendered with spirit, fidelity to patient observation, the representation of space above, before and behind the figures, and with the landscape of great grandeur added, represent her style" while the teachers and children are endeavoring to make the interior of the school rooms attractive with pictures and books, the outside needs some attention. Many school grounds are cheerless being without a fence or a single tree. Fences and trees do grow in Winnebago county soil for they are found around our homes. Let us hope for a revival of house-painting, tree-planting and fence building for the district schools of Winnebago county and the State of Illinois.

Patriotic exercises by pupils of District No. 69. This consisted of a series of drills by girls dressed in white and carrying red, white and blue banners and boys carrying the flag finishing with a tableau.

Whistling solo, Silvery wave Miss Carrie M. St John: Stereopticon lecture "The Farmers" and the schools" by O. T. Bright, Chicago Superintendent of Schools of Cook county.

(It would be impossible to do this lecture justice in the report without the pictures. It teaches lessons of the utmost value to the school and the home in the most impressive and practical way. It should be given at every county Institute in the State—Secretary.)

FRIDAY MORNING, FEBRUARY 21, 9:30 A. M.

Music Piano Solo, Concert waltz, Moszkowski, Miss Laurena Landers President—In the Farmers' Institute work, as well as the agricultural work we are ready always to give credit to those to whom credit is due. The forenoon session is wholly devoted to the horticultural interests and we have with us Senator Dunlap who has been one of our truest champions in the Senate in connection with the State Farmers' Institute, both with our experiments, in our regular work and in our library work and it is with great pleasure that I introduce to you Senator H. M. Dunlap and ask him to preside over the meeting:

Senator Dunlap—Mr. President, Ladies and Gentlemen: I suppose that coming before you this morning as presiding officer I might take up two or three minutes in stating what the Horticultural Society stands for. The State Horticultural Society stands for better fruit on the farms, it means better fruit on the farmer's table. The effort is to induce every farmer in the State to plant fruits and vegetables for his family use: also to bring their knowledge what experiments can do. The experiment stations are for the purpose of testing new varieties of the fruits so that the money of the individual farmer is not expended for new and expensive kinds that are worthless. The State Horticultural Society tests these varities and can say whether they are adopted to the particular locality in which they are to be planted and whether they are worthless or not. We find in the experiments, out of every new 100 varieties that 75 per cent of them are absolutely worthless and of the remaining 25 per cent a very large per cent are better represented by older varieties and better tested than the new one can be, and of the new varieties there is hardly one in every 100 that is entitled to the consideration of the fruit grower or farmers of the State. So you see that when new varieties come up asking for an investment of from one to five dollars according to the audacity and cheek of the introducer, you will find in 99 times out of 100 that your money is simply wasted as an investment. It is one of those kind of investments like some of the mines in the Rocky Mountains where we invest our money in holes in the ground. So then this society stands ready to do all the experimental work for the farmer. It also teaches adornment of the homes of the farmers with shrubs, trees and lawns and everything that makes life in the country worth living and everything that makes life in the country more advantageous than life in the city. It stands for better fruits in the market for the people who are not able on account of living in cities to grow their own fruit. It means the encouragement of commercial horticulture in the State of Illinois. So that Illinois can furnish apples for the people of Illinois. Illinois has stood at the head of the procession in all the great expositions of recent years, showing Illinois is the greatest commercial fruit producing State. This seems impossible in Northern Illinois, but if you travel through the orchards of Southern Illinois where you can travel for 100 miles with apple orchards on either side of the railroad you will see what horticulture is coming to in the next few years. Some of the owners realized from $25 to $200 an acre out of the products of the orchard. Some do not realize anything. They are largely made up of the class that thinks if you plant a tree it will take care of itself. The Horticulture Society stands for better methods of growing the fruit. I have traveled through Arkansas, through Missouri, the Rocky Mountains in Colorado, Nebraska, Iowa and the East and I know of now better place than Illinois for the production of apples in a paying way. I believe that Illinois will become as famous for her big red apples as California is famous for her oranges.

We will proceed with the program this morning as laid down by officers of the State Farmers' Institute, and we will have a paper on Small Fruits by J. L. Hartwell, President of the State Horticultural Society.

SMALL FRUITS.

J. L. Hartwell, Dixon, Ill.

Only fruit which is thoroughly ripe is wholesome, palatable and fit to eat. A berry in prime condition for the table will not endure the ordeal of boxing, hauling to market and running the gauntlet of the wholesale and retail trade.

We are told that only he who has picked an orange from a tree has eaten a really good orange. Those who depend upon the trade for their supply of small fruit have at least one pleasure in anticipation that has never been realized.

The only way a farmer may have small fruit of the best quality is to grow it.

My list of acquaintances among farmers and their farms in Illinois is quite large and pretty generally distributed over at least the north half of the State. I think I am making a conservative estimate in placing the number of farmers who grow a variety of small fruits in sufficient quantities to supply their families at not over one-tenth, and not more than one-half grow small fruit of any kind. There are a number of reasons which explain this condition of things. The first is the want of information on the subject; second, an exaggerated idea regarding the amount of skill and work needed in growing small fruit; third, a failure to appreciate the value of fruit as an article diet. I will refrain from discussing the last point, fearing that I might trespass upon the work of the division of domestic science and household economis.

The principles which hold in the growing of any ordinary farm crop such as corn and potatoes apply in a measure to the growing of small fruit, the soil which produces one class will yield a fair return of the other so far as fertility is concerned. No farmer expects a good corn crop unless pains is taken in the preparation of the soil and the growing crop is thoroughly cultivated. The importance of the latter increases as the amount of rainfall diminishes, and when we remember that fruit is little more than seasoned water, the need of thorough cultivation in the production of berries is even more important.

With the usual treatment if the worms do not take the currants and gooseberries, the blue grass will. About the only attention the cane fruits receive is the annual visit at picking time, unless it be on the occasion of searching for the nest of a wise old hen who is seeking for a place where she may reproduce her kind which is less infected with vermin than the chicken house. Because the strawberry bed will not continue to bear for an indefinite number of years without being renewed, the average farmer votes himself a failure as a strawberry grower.

The failure to grow small fruits by the farmers of our locality especially is not because they do not like it. Drive out into the country in any direction from Dixon, pull up to a farm home for dinner and you will be served with blackberry jam, canned straw berries, currant jelly and gooseberry pie, and if you look around it is rare that you can find any plants to reproduce this fruit, some of it came from Centralia or Anna, some from Benton Harbor, and part of it, possibly all from my farm. If you suggest to the man of the house the propriety of growing such things he will say that he has no time to fool with berries, "It is too puttering business." This kind of talk would have more weight with me if I were not personally acquainted with a large number of farmers who grow their small fruit and at the same time conduct a large farm successfully.

I realize that scolding is a poor agency to effect reformations of any kind.

The Illinois farmer must first know then apply, a few simple principles underlying the successful growing of small fruit. Let us consider some of them.

The question of varieties of fruit is much more important than is the question of the breeds of stock. If the farmer feeds his corn to a drove of Poland China, Chesterwhite or Berkshire hogs, he may if the cholera don't strike him, except fair returns from his crop. Either a Shorthorn, a Pollangus or Hereford steer will make a good feeder. Furthermore if you are at all informed on breeds they are easily distinguishable at sight. On the other hand an expert cannot recognize many varieties until they come to bearing which is never the case when plants are in condition to move. It is easily seen that he who purchases small fruit plants, is practically at the mercy of the dealer and the temptation to misrepresent is more than many, if not most agents can resists. Never buy a plant of an agent unless you are sure that he is honest and that he represents an honest grower.

The number of varieties of small fruit which are offered by the trade is almost limitless. The number of varieties of grapes in one catalogue from which I copy is 71, in another the number of varieties of strawberries is over 50. I shall have over 100 varieties of strawberries in my experiment station when I complete my spring's plantings. Most ofthese varieties are practically worthless everywhere and not to exceed a half dozen in any one class in any one locality are worth planting. One quite striking feature about this question of varieties is, that as a rule, the cheaper the plants are quoted the better the variety. To determine what varieties we should plant consult the nearest successful grower or the list recommended by the State Horticultural Society in its annual report for your district. Illinois does not reach quite from the Equator to the pole, but it does cover considerable of that distance and contains a great variety of soil and climate.

Every farmer should have some modern garden tools. With the Planet Junior 11-tooth cultivator practically all the cultivation of your vegatables and small fruit garden can be done with a horse. You will find this tool very servicable in cultivating the potatoes and the corn where the latter is not too tall for the wheel cultivator.

A horse would cut a sorry figure in an ordinary farmer's vegatable and fruit garden. Usually the horse's head would be at one end of the patch and the driver at the other. More frequently everything is fenced from this sacred precinct but weeds, the farmer's wife and an occasional old hen.

If I were planting this part of the farm economy it would contain not less than an acre and would be at least 20 rods in length.

Everything including such small stuff as lettuce and radishes would be planted in rows running the long way. Those things which would continue from year to year without renewing, such as grapes, raspberries, blackberries, currants, gooseberries and pie plant, would be planted on one side in rows 8 feet apart. One of these long rows would be set to currants, gooseberries and pie plant, and there would be one row of each of the other sorts.

Many of these plants may be fruited 10, 15 and even 20 years without renewing. The currants, gooseberries and pie plant should be set 4 or 5 feet apart in the row, the raspberries and blackberries 3 feet, and the grapes 10 feet. They may all be set in the spring, currants and gooseberries preferably in the fall.

The remainder of this field would be devoted to strawberries and vegetables, and the planting and care of the latter may be made more of a play spell than work by using a garden seeder and wheel hoe. Two or three rows of strawberries should produce enough fruit to supply any ordinary family, with an occasional treat for all the nearby neighbors. Five hundred pounds of grapes, 100 quarts each of blackberries, black and red raspberries to each row, from five to 15 quarts of currants and gooseberries to each plant, and from 500 to 1,000 quarts of strawberries would be a reasonably good crop after the plants get to full bearing.

Pinch back the new canes of blackberries and black raspberries when 2 or 3 feet high, cut out, remove and burn old wood after fruiting season.

Cultivate everything as level and shallow as possible, confine the strawberries to matted rows not more than a foot in width and cover with some kind of litter after the first hard freeze. This mulch should be raked between the rows as soon as the plants start to grow in the spring. Mow the plants as close to the ground as possible, after the fruit is picked remove all litter, and thoroughly cultivate during the remainder of the growing season when the bed should be mulched as before. One setting of strawberries may be fruited two or three times successfully. To be continuously successful in growing strawberries a new bed should be set each spring, by so doing it will not be necessary to purchase new plants after the first year unless a change of variety is desirable.

A few special points and I am done, by bagging a few bunches of grapes when quite small and placing the ripe bunches in the bags in a dry cool place, the season for fresh ripe fruit may be prolonged a month or more. An excellent and healthy drink can be made from any surplus fruit by cooking a little draining off the juice, and sweetening and sealing in jars or bottles. Most garden cultivators will kill weeds when they are quite small and cultivate them when they are larger.

The currant worm is easily disposed of by spraying early in the season with a half teaspoon full of Paris Green to a pail of water or later with Helibore when the fruit is nearly grown.

Finally remember that while a fruit tree agent is not necessarily dishonest, his imagination is highly developed and it will pay you to keep your wits about you when he with his magnificient display of beautiful pictures gets you in a corner.

Now this paper is open for discussion if you care to discuss it for a few moments. I would be glad to hear any questions or experiences.

Chairman—If no one desires to discuss it we will proceed with the next number on the program. I will say that Mr. Aldrich is a practical orchardist. I have been in his old and new orchards and I know they are well taken care of. Mr. Aldrich, vice president of the State Horticultnral society:

ORCHARD MANAGEMENT.

(By H. A. Aldrich, Neoga, Ill.)

One of the most promising industries for the future, where the surroundings are favorable is that of apple growing. It is true there is an immense acreage being planted at the present time and when one stops and thinks for a moment of the millions of trees sold annually by the nursery men, one is tempted to use that same old cry that our grandfathers heard in days gone by "that very soon, apples will not be worth picking." But the man who has been trying to raise apples for the last 20 years knows better. The business of apple growing in Illinois is not likely to be overdone, but that there is many an orchard that does not pay, no one will deny. But the apple industry is like almost all other lines of business, successful if carried on scientifically and with sufficient capital. The business of the future will be carried on more in specialties; that is certain sections will be noted for certain varieties. It would be the heighth of folly for the west to attempt to raise Baldwins in competition with the east, and New York and Michigan are just beginning to realize that they can not raise Ben Davis in competition with the central west. Do not think that we ever will breed one certain variety of apple that can be successfully grown in all sections of our Union. You would first have to make a complete change in soil and climate if you did.

The method of preparing land for an apple orchard should vary according to the conditions of the land, but it is safe to say if it is in the fall, just simply plow it, but if in the spring prepare your land as for corn. Choose an elevated position if possible, rather than low lying or bottom land. The circulation of air is better and there is less danger from frost. Buy your trees as near to the place where they are to be set as possible. A long journey by freight with one or more transfers from one railroad to another, and the consequent delays are no ways conducive to the long life of the tree. In the selection of your trees at the nursery do not pick altogether for size. It is to the nurseryman's interest to raise and encourage the planting of those varieties only, which make the straightest, most rapid and cleanest growth. Now the variety that is the cheapest and best for the nurserymen to grow is not always the most profitable for the fruit grower. The nurserymen are not altogether to blame for this state of affairs for we have forced the issue upon them, either to raise that class of trees or retire from the business. Our conception of what constitutes a first class tree are altogether wrong. We display our ignorance by insisting that a first class nursery tree shall be one that grows straight and smooth, tall and stockey, while our better judgment ought to tell us that perhaps half the varieties will not grow that way. It is time for us to begin to learn that a tree may be first class and yet be small, crooked and gnarly, providing it is characteristic of that variety. Large size ought not to be the best recommendation in a nursery tree. Then choose your trees for vigor, freedom from insects and fungi and firm hard growth. The toughest and best trees are those of medium growth. Opinions differ and always will as to the age a tree should be when planted, but as a general thing there are more mistakes made in planting to old than to young. A majority at the present time favor two year old trees, but many a large commercial orchard is set with yearlings with splendid success. All nursery stock should be well heeled in as soon as received. Be sure and work the earth well down in among the roots when heeling in, so as to exclude the air as much as possible. Stock that has become shriveled from any cause can be greatly benefitted just before planting by being immersed in water. In fact it is a good plan to keep your trees in a tub or barrel of water while planting. The tree then goes into the ground with every cell, both root and stem filled with moisture.

There is quite a difference of opinion as to the best time to plant, fall or spring. This difference is mainly caused by difference in locality, but still you will find men in the same neighborhood one wold not plant in the fall and the other would not plant in the spring. In central and southern Illinois think that fall planting is to be preferred. If planted in the fall the trees become better established and they are ready to take advantage of every little spell of weather and the sap is flowing and they are growing long before the ground is dry enough to allow of spring planting. In the fall you have more time and can use more care in setting; the conditions of the soil is generally better. But what is of more importance the little baby tree by being more firmly established is better able to withstand a summer's drought. All these little differences in favor of fall planting, sometimes amount to almost one season's growth in that little tree. But in all fall planting there is one thing that should never be neglected and that is to mound up the earth from 8 to 10 inches around the the body of the tree. In fact it pays to do this every winter for four or five seasons after those trees are set, but do not take the soil from near the tree, so as to leave holes for the water to stand in, nor the frost to penetrate the ground too near the roots. When planting in the fall do not cut back the tops at that time, because the roots are not in condition to supply the mositure that would be lost from the wounds. In the spring just before growth begins, cut back to a good strong bud. In setting the young tree lean it a little to the southwest and be sure that the soil is tamped in hard around the roots, but do not bruise the roots by getting in the hole too soon with your feet, not until the roots are covered, and set a little deeper than it stood in the nursery. Since the heavy winter damage of 98 and 99 the observing orchardist is beginning to have a more favorable opinion of deep planting. Deep planting does not injure the stem of the tree but the little feed roots must have air as well as the leaves. The distance apart to plant apples is a good deal owing to locality. The most common distance is 30 feet but there is a growing conviction that we have been planting too close and now the favorite distance is 33 feet or two rods, and no doubt as we have more experience, the orchards of the future will be planted still farther apart.

It is sometimes recommended to plant standard market varieties at regular distances with quick growing trees of early bearing sorts as fillers, the latter to be cut out when the others need the room. The advice seems all right to those who have never tried it but those fillers have to come out at the right time and before they injure the other trees and that is generally when they are in their prime and getting in their best work and it takes more courage than the average fruit grower possess to cut them out. Plant the trees in perfect lines both ways, not only because it looks better but it makes the cultivation easier and better. You can either set a peg for each tree and use a planting board, or set stakes all around the outside and plow out a double furrow for each row. The little details are only a matter of good common sense. The little stakes will show all the better if whitewashed. For the first few years after planting it is better to plow the land rather deep with the plow and it can be planted to any crop that has to be cultivated and that will not injure the trees but under no condition should any small grain or grass crope be allowed to mature. When planting a commercial orchard the different varieties should be kept in as near solid block as possible for convenience in gathering but those blocks had better not be over four or five rows wide as it has been proved that some varieties of apple are not perfectly self fertile. One of the most trying experience of a fruit grower is to see his trees bloom full and then never set an apple. If you will notice closely you will find that not more than one tenth of the blossoms ever do set fruit. It is only when the failure of the blossoms to set become general that we pay any attention to it. In searching for the causes that lead up to this want of pollination in our orchards, we have met with so many conflicting experiences that some good orchadists have doubted the whole theory. But if we obtain better result from making a mixed plantation in that way what is the use of risking the loss of a crop every once in a while just to carry out a pet theory. This is a subject upon which the wisest of us are willing to admit that they know the least and what is the use of arguing with a man trying to convince him that he is wrong when he is making it pay. It is useless to assail anything that pays, either logic or science.

In setting a commercial orchard it is better to confine yourself to very few varieties and let those varieties be such as have been tried and tested in that section. A mistake here made would be fatal to the whole business as it would take almost a life time to correct such an error. There is a great hue and cry raised against the Ben Davis, but there is no denying the fact that it has been and is today the best money maker we have. It may be crowded out in the future, but it will have to be done by an apple that has more good qualities than it has. The Jonathan and Grimes Golden are also proving profitable varieties.

On the subject of pruning we must all confess that we are but beginners, and those who have thought and studied and know the most about it, are the freest to confess that they know the least. We are often told to only prune with the knife when every one knows who has ever grown an orchard that it is an impossibility. It is better to do some pruning every year than to let them go two or three years and then prune heavily. A very heavy pruning has a tendency to make wood growth and is usually at the expense of fruit. After you get your orchard into bearing keep it so by doing a little pruning each year. Whenever two branches cross so as to rub against each other, one of them should come out. Whenever one branch rests on another the weaker should be cut out. As a general thing all suckers should come out, but if the head of the tree is open in places, or if some parts of the tree are making a weak growth, enough suckers should be left to protect the exposed limb or to take the place of the weak growth. An ironclad rule that removes every sucker may result in the death of the tree, and when necessary, by allowing them to grow you renew the vigor of the tree. Be very particular to protect all wounds above one-half inch by painting. If you want good, sound, high colored fruit you must keep the top thinned out to let in air and sunshine. Pruning may be also a means of thinning the fruit. We may say that fruit bearing is merely a habit, but given a good healthy tree which has been grown from a cion cut from a good bearing tree in years gone by, there is no reason why that tree should not bear a good crop of fruit every year. And yet you can go into your orchard with your knife and saw and in one-half hour's time knock that bearing habit higher than a kite and there can be no ironclad rule that can tell you how not to do it for the same work that on one tree would be a benefit on another would be an injury.

You have got to study these things out for yourself and learn to prune so as to have a crop of flower buds ready to open each spring and each individual bud placed on an equal footing as regards light and space.

A few orchards from some peculiarity of their location are doing well in sod, but all Illinois orchards, to obtain the best results, must be cultivated. The returns from the orchards that have been cultivated in the last few years have been such an improvement over the preceding years that the owners often wonder why they had not thought of it before. This cultivation should begin early in the season because trees complete most of their growth by the first of July. This early cultivation holds the moisture in the soil that has accumulated during the winter and spring. It warms up the soil and puts it in such a condition that the little feed roots can gather up the fertility needed at that time. The best implements for this purpose are such as provide about 2 or 3 inches of fine dust mulch all over the surface of the orchard in the easiest, quickest and cheapest manner possible. The time at which this cultivation should cease will depend entirely on the condition of the orchard and the season. Here is another of those cases in which the orchardist will have to depend on his own judgment as no ironclad rule can tell him just when that cultivation should cease each season. Right here is one of the times when he can make or lose his crop of fruit for the following season. If it is a season with an abundance of rainfall through July and August, or if the trees are making an extra wood growth, cultivation should cease early. If it is rather inclined to be dry the latter part of the season and the trees are loaded with a heavy crop of fruit continue the cultivation later. At the last cultivation sow some kind of a cover crop, as no orchard should go through the winter without some such protection. This crop grows through the autumn and winter and is worked into the soil in the spring. There are several good reasons for the sowing of this cover crop. It adds humus to the soil and without humus a soil has no life. A soil without humus can not hold moisture and the trees will suffer for want of water, thereby making small apples and most of them dropping prematurely. This cover crop also saves fertility and it protects the roots of the trees during an excessively cold winter, and we never know beforehand when one of these winters is going to hit us, so it is best at all times to be prepared.

But with all his care in the selection of his trees, cultivation, pruning and cover crop, it does not insure success, for some hungry insect or mysterious fungus pest may suddenly invade that orchard or ruin the crop. Everything lets loose a horde of pests that must be met by the successful fruit grower with his spray pumps loaded, spraying once just before the blossoms open, with bordeaux and paris green mixture, thereby getting in one of your best blows against the canker worm, bud moth and all kinds of catterpillars, and last, but not by any means least, the apple scab. Just as soon as the last petals drop give them another dose of the same medicine and a week or ten days later still another one. Now comes another time when the fruit grower will have to use his own judgment whether to make a later spraying or not. With all these expenses and drawbacks to contend with, it would seem as though orcharding would be a very poor business, but they are just the things that will make it profitable. If all we had to do was to set the trees and they would grow and bear fruit without much care or culture, the crop would be so immense that we would have an over supplied market sure enough. Owing to the time and capital it takes to bring a large commercial orchard into bearing many an apple grower will lose heart and give it up. For this reason the industry will never be as satisfactory to the average farmer as the raising of stock or grain. As it is, the apple industry has more to offer to large capital than any other agricultural pursuit, but the superintendent must be a careful, observant, scientific horticulturist and with his science he must display good common sense. There will be a great demand for just such managers in the future, and the Illinois College of Agriculture will be taxed to its utmost to supply just such material.

Chairman—We hope you will take advantage of this opportunity to discuss the question. We have a few moments for discussion of the questions.

Mr. Cambridge—I would like to ask you what do you consider good mulch?

A. I have dropped back onto rye. I have tried cow peas and soja beans. Oats is a good thing and they don't bother you in the spring. I have used rape but it doesn't make as good a cover crop as rye and it is like a mulch all summer.

Mr. Graham of Winnebago—I would like to have you tell me something satisfactory to work with. The whiffle-trees hurt the trees unless I am as careful as I can be, and I can not get near enough to cultivate next to the trees. I mulch in the winter and scatter in the spring and cultivate the trees all summer.

A. Well there is a harness made on purpose for it and you don't use doubletrees. I use that for the first two rounds and I don't use it after that for it hurts the horses' shoulders.

Mr. Hunter—I have a harness, Baker harness, made in New York. Has no tug, attaches by a chain to the piece of wood that hangs on the belly band in the harness, and my man has used it for a day at a time and he likes it for a harness.

Q. What implement do you use?

A. Always when the trees are young I use the plow and plow deep, except close to the tree. I want to force the roots down as low as I can make them go.

Mr. Schmerhorn—How long do you continue?

A. Up to the bearing year, until you can't get around the trees without bother.

Q. Your harness is the Sherwood?

A. Yes.

Mr. Spotts, Carroll county—I have a crab apple tree that is in bearing age but does not bear. I would like to know what I can do.

Q. What variety is it?

A. I am unable to say.

It is pretty hard to answer that. I have walked around my trees and you see trees that skip, have an off year every other year and probably the next one never misses in seven years. Of course you can force a tree into bearing by radical methods.

Q. That tree has been cultivated and has been brought into blossom but thus far it has not borne any fruit.

A. Is there any other crab apple trees close to it. It may be want of pollenization.

Tell the gentlemen about your reversible discs.

A. With the Clark's Cutaway harrow you can throw either from the tree or to the tree. They are making a machine that is double and you don't have to reverse it at all and it leaves the ground level and it is the best implement I have found so far, because it leaves the ground in good shape.

Mr. King of Bloomington—The apple trees in our orchard have individuality. Their characteristics are bred right in the trees and we must breed our apples just as you breed your stock, and the nurserymen will have to show the pedigree of the tree before very long.

Mr. Schmerhorn—I wish to endorse every word after 15 years experience

Mr. Graham—Is there any way to make cherry trees bear? I bought some of an agent, and he was a dandy talker and they grew up to be fine trees but they are as devoid of fruit as though they were oaks.

A. You have got to try different things. It is like asking a doctor 100 miles away. If they are of one variety I would try to get some other variety. But there is one thing you should notice—the growth of your trees. Wood growth and fruitfulness do not go together.

These trees made an awful growth and I thought it was probably too much wood growth.

Mr. Hartwell—I have three varieties set in a row. Two of the trees are eight inches in diameter and all the others are not half the size. The others have borne heavy for three or four years, and the two didn't bear at all until the last year and they bore me a heavy crop of very fine cherries and possibly you may get some fruit some time.

Yeoman's Wedding Song—Poniatowski, Mr. Myron E. Barnes.

Mr. Aldrich in Chair—The next subject on our program is "Marketing Fruit" and I can assure you no one has had more experience or is more competent to talk to you than our own chairman, Senator Dunlap:

HARVESTING AND MARKETING THE APPLE CROP.

HENRY M. DUNLAP, Savoy.

The growing of the trees, the selection of varieties that are profitable and adapted to the locality, and their proper care in the orchard to make them produce fruit that is free from worms and fungous disease is a part of orchard culture that is an entirely different branch of the business from that which I am to speak. A man may be thoroughly posted in all of this that I have mentioned, he may be able to grow fruit to perfection and yet know but little about the marketing of the product. Some, and I may well say many, growers prefer that someone other than themselves shall take charge of the apple when it leaves the tree. As a consequence there are now many packers and shippers, where a few years ago there were practically none. Apples were then packed by the grower and forwarded to market to be sold on commission. In many instances this packing was done so poorly that the commission men were disgusted in the handling and gradually these same commission men began to buy small lots of fruit in the orchards and pack the fruit themselves. This was satisfactory at both ends of the line—the grower got as much or more for his fruit and, what was still better, knew what he was going to get before the fruit left the premises on which it was grown. The buyer was pleased because he packed the fruit in such manner that it would sell at a much higher price, and if necessary would keep much longer.

Today, as in the past, it is no doubt better for the grower in most instances to sell his fruit to reliable packers and shippers in the orchard, either by the barrel or in the "lump," picked down or on the trees. This method will no doubt be an education to the grower. The latter seeing the methods pursued by the packer becomes an imitator and gradually learns better methods. In many instances he is employed by the buyer to do the work under the direction of the buyer and develops into an expert packer in a short time.

In New York, where apple growing as a business has been carried on much longer than here, the growers do the packing to a very considerable degree and the fruit is sold, packed and in the barrel delivered at the station. When our growers have become reliable packers of good fruit then no doubt this system will prevail here. This would have its advantages to the grower in that he would receive pay for all his fruit, and for the labor of packing, which in itself is a considerable amount and should go into the grower's pocket.

This will come only when the grower becomes an expert and reliable packer. Commercial orchardists should make this a study. It will pay to do so. Whenever the buyers find a man whose packing can be relied upon they are willing to pay well for his fruit.

Fruit always looks its best on the tree. The grower should, as an important part of his education, follow his fruit to the market a few times and see it opened up there. Often he will find his fruit slack, poorly faced, and many inferior specimens in the barrels. Especially is this apt to be true if he leaves the packing to hired help or to the "boys." The trip to the city market to inspect the fruit there on its arrival will be worth to the grower many times what it costs. Try it once! The commission man is blamed for a great many things and often justly, but when one sees the fruit of the average grower arrive in the market he is satisfied there are some things the commission man is not to blame for, and one is poor packing on the part of the shipper.

Many methods are in vogue just now in landing apples from the tree to the market. I will mention some of the better ones.

PICKING FROM THE TREE.

There are really but three methods of doing this. One is the method still pursued by some when the fruit has been sold and the buyer is not present and a part of the contract is that the fruit shall be "picked down" by the grower. I refer to the old-fashioned method of "picking with a club." This is not to be recommended, for almost invariably there is trouble with the buyer. He objects to having it done that way.

Another method is to pick into grain sacks. The sack is slung over the shoulder with a wide strap. The mouth of the sack is kept open with a short piece of hoop sewed into the edge of the mouth of the sack and partly around the opening. Picking in the sack has its advantages and also some disadvantages. Among the former may be mentioned that the fruit is not bruised as by tossing it into a basket, the sack is easily carried and enables the operator to use both hands in picking. The objections are that the "bloom," if there is any, is likely to be rubbed from the fruit, that the shifting of the sack puts many small bruises on the fruit where the apples rub against each other. In delicate skinned or light colored varieties this is especially noticeable.

The third is picking into baskets. These should be half bushel round baskets with drop handles. The baskets should be smooth on the inside—that is free from strips around the inside or bottom. The baskets should be lined with burlap to prevent bruising, and a short iron hook should be attached to the handle to suspend to basket from the limbs, thus enabling the picker to use both hands. The advantages of using a basket lies largely in the fact that if the apples are carefully placed in same they are not bruised while in the basket and the bloom on the fruit is not rubbed off as in the sack. The objections to the baskets are that they are not so handy as the sack and that careless pickers are disposed to toss apples into them as they set upon the ground or hang on a limb a few feet away. Taking it all in all I believe the basket is the proper article to use in picking fruit, although for Ben Davis and other red varieties it has been my custom in the past to use the sack for that purpose. For light colored apples always use the basket.

WHERE SHALL THE APPLES GO TO

from the tree? On the ground, or to the apple house to be sorted later, or on to the packing table to be barreled as fast as picked? At this step we are apt to make our mistake. My experience is that apples packed from the tables and immediately placed in cold storage will give by far the better results. I have tried both methods and know whereof I speak. Of some hundreds of barrels of Ben Davis and Willow packed from the tables last fall, immediately placed in cold storage and moved the last of May, not a single barrel had to be repacked. This lot included some 25 barrels of No. 2 stock, also hand picked. It adds from two to four months to the keeping

quality of the fruit to pack as soon as picked from the tree and send at once to cold storage. In shipping from Clay, Richland and Fayette counties this year it took usually three to four days before the fruit was in storage; sometimes five and six days. Delays are certainly dangerous in case of fruit that you expect to hold in storage. Two cars of Jonathans were iced at shipping point and one was not. The difference in condition is quite marked in favor of the cars that were iced.

MAKE NO MISTAKE ABOUT IT.

You can not afford to let your fruit lie under the trees or in a building for two weeks before you barrel. Every day's delay in packing and shipping will cost you money and quality in your fruit and if you are not the loser, the party who buys it is. Every year we hear that southern Illinois fruit will not keep. The reason is that it is allowed to ripen up in piles under the trees or in the barn until its keeping qualities are lost. Fruit grown in a warm latitude or harvested during a warm October must be quickly handled. Fruit grown in southern and central Illinois, if properly handled at picking time, in the way I have suggested, will keep longer in storage than New York Baldwins.

BARRELING APPLES.

A good barrel is essential if you wish to store your fruit, have it keep well in storage and sell well in the market. We suffer from lack of good cooperage. A tight barrel is the best. You don't need ventilation in your barrel for winter fruit. The better it is made the better results you will have. There will be less loss from shrinkage of fruit, rats and mice and other causes. There are a good many ways of barreling fruit. We have our ideas how we are going to do it before the season opens, but we hardly reach our ideals. In my own orchards I have about eight pickers and six sorters and barrelers in each gang. A sorting table constructed of the size and in the manner represented in the cut is provided. This table is set in the center of 16 trees; sometimes if fruit is scarce and trees are small in the center of 24 or 36 trees. In other words, four or six rows are carried forward at once and the table is moved along the center rows and set in the middle of the square at each move. One man usually nails the hoops, the headliners and takes out the heads of barrels, preparing them for filling. It is quite important to have headliners, as it prevents loss in shipping and facilitates in the examination and inspection of fruit in storage. This man usually heads up the barrels when filled. A second man does the facing, a third one, who should be a good apple man and foreman of the gang, empties the baskets and assists in the sorting. He inspects the fruit as sorted and directs the work. This leaves three men in the gang, who do nothing but stand at the table and sort, unless it happens that the pickers are not able to keep the table supplied, in which case a man from the table is put into the trees to pick until the balance is restored.

HOW SHALL WE SORT OUR FRUIT?

Well, that depends, of course. If you have good fruit and it is worth money in the market to warrant you in so doing you will make two grades. One a strictly No. 1 or fancy grade, and another which will take fruit that is slightly defective but good for immediate use, commonly termed No. 2 in the market. Ordinary seasons it will be best to sell this No. 2 fruit to the evaporator or the cider mill rather than pack it in expensive barrels and add to this the cost of freight and commissions, getting no more for it net than you would have realized in bulk in the first place.

Another advantage in selling to the evaporator is that you take it out of a market of green fruits and transfer it into another market of dried fruit, where it does not come into competition with your good green fruit.

Face the barrel with good, well colored apples of even size, put in a basketful of another layer of similar fruit on top of the facers, then fill your barrel

with fruit free from blemish or worm holes of a size not smaller than 2½ inches in diameter for Ben Davis and Jonathan or 2¼ inches for Winesap. Settle this fruit in barrel as each basketful is emptied in by shaking the barrel. This is all-important, as your fruit will be tight in the barrel and require less pressing of the head and consequently less bruising of the fruit. If No. 2 fruit is packed it should be faced with No. 2 fruit and not with No. 1, as is done by some packers. Honesty is certainly the best business policy to pursue for the fruit grower and packer. There is no doubt about it, it pays. You may be shrewd enough to fool a buyer once, but once fooled he will shy clear across the street when he sees your brand in the market. You may think it pays to be "smart" or "slick" in the fruit business, but it don't. Better miss a trade and be honest than make one and be dishonest. There are enough dishonest men in the business at both ends of the line to make an honest man when found thoroughly appreciated.

After the barrel is full and fruit well shaken down, adjust the apples on the top so that they are as nearly level as it is possible to have them. This will insure equal pressure throughout the barrel, will prevent your fruit being bruised unequally, will present a much better appearance on being opened, and the fruit will have less "slack," as a result of a few months in cold storage.

Stencil or stamp name of the apple on the faced end of the barrel. On your No. 1 fruit also stamp your own name. On the No. 2 fruit leave your name off, but stamp the name of the apple. If shipping to a commission house they will furnish you with a numbered stencil which will answer in place of your name for them to make returns by.

In hauling barreled apples to the car and in shipping lay the barrels on the side, never stand them on end if you wish the fruit to remain tight in the barrels. In shipping carloads of fall or early winter apples I would ice the cars if the distance is very great, say 200 miles or more. The time taken by the railroad in getting the cars "placed" on arrival in a large city is sometimes several days, and again the storage companies have more than they can attend to and more time is consumed.

THE SELLING PROBLEM.

Ordinarily it is the part of wisdom to sell when you get a fair offer for the fruit before you have too much money invested in freight, cartage, cold storage and commission. This problem is one which the individual should and must solve for himself. If he is a good salesman and has sufficient amount of fruit to warrant the expense of travel he can consign his good fruit, if well packed, to cold storage with a fair prospect of making the investment pay. Where there are several shipping from the same point they can organize a shippers' association and have the business done through one of their number as agent. There are many ways of selling fruit in the orchards, as, for example, estimating the fruit on the trees and selling it in the lump, either the buyer or the seller to pick the fruit, as shall be agreed upon. I have seen considerable money made and lost in this way by over- or underestimating or by storms. Another method but little in vogue is to advertise that the fruit will be sold on a given date on sealed bids, the owner reserving the right to reject any or all bids.

In my opinion the business will probably come in time to selling the fruit by the barrel in the orchard. In this way the grower is paid for what he has and the buyer having no risk to run can afford to pay the highest price that the fruit is worth. Selling winter fruit on commission will soon be a thing of the past except in isolated localities.

The past season has been an exceptional one for the grower. He has been able, on account of scarcity, to get a good price for his fruit, orchard run. This will probably not happen again soon and some way must be provided to work up and make use of the poorer grades of fruit in each neighborhood. This can probably be done in the establishment of drying houses and otherwise. Whatever you do, try to build up a reputation in the market for your brand for good fruit and an honest pack.

DISCUSSION.

Mr. Galbe: I would like to ask you about the method of keeping fruit. I merely raise enough to keep and would like to know how to keep it at home.

A. Well, I have thought of that. I will answer by saying that in keeping fruit in the farmer's cellar you want to observe various conditions. You want to put the fruit in pine boxes and put a tight cover over. Get shoe boxes or drygoods boxes and put the apples in and put the boxes up from the ground, resting so that there will be a circulation of air around the boxes, nail them tight, and whenever you have a cool night in the fall open your window and close in the morning and you will be surprised what a difference it will make upon the keeping qualities and the flavor. Just put some of your apples in boxes and have some the old way and try the flavor. You don't have to inspect your apples all winter. Your apples will be crisp and sound all through the season. If you number the boxes 1, 2, 3, and put the same variety in each box, you won't have to open the boxes but use the apple in its season, and with Willow Twigs and Ben Davis last, you will have good apples all the year.

Q. Are boxes better than barrels?

A. I don't know as they are better, but usually they are more easily procured and I would rather have a nice clean box than a second-hand barrel, and it is always a trouble to get hold of new barrels, and if there has been anything in the barrel it will give the apples a flavor. They are quick to absorb flavors.

Q. Is it best to line the barrel with paper?

A. All the better.

Q. I would like to ask this question: It has been my experience in buying apples that the apples would be nice at the head and bottom of the barrel and poor in the middle; why is this thus?

A. I have noticed that myself. Somehow or other when a man goes to fill a barrel he fills the face of the barrel with the best looking ones and then somehow or other the poorest apples get into the center of the barrel, and in the same connection I have heard that in the east, we don't do it out west, they put a stovepipe in the center and fill it with the little ones. As a matter of fact the buyers will usually go through one barrel before they will buy. They will take one barrel in 20 and empty it out so you can see what it is. All attempts to deceive are not going to last much longer in this regard.

Q. What variety of apples do you prefer?

A. For eating or cooking? The best apples for growing in the State of Illinois are the Grimes' Golden and Jonathan, and the profitable apples are the Ben Davis. If you object to Ben Davis grow Gano, because it is Ben Davis with another name and you may like it better.

If there is one thing that has placed horticulture on a paying basis more than any other it is the spraying; and Mr. J. C. Blair of the State Experiment Station will speak this morning on the subject of spraying.

I will ask your attention for a few moments to this particular part of successful orcharding in Illinois.

DIRECTIONS FOR SPRAYING.

Prof. J. C. Blair, Urbana, Ill.

The important details of spraying are fully discussed in bulletin 68 of the Illinois station. The fruit grower should thoroughly familiarize himself with those details before attempting to follow the directions given below:

For successful spraying, six points must be kept in view:

1. Pure materials.
2. Proper preparation of mixtures.
3. Proper method of application.
4. Time of application.
5. Proper machinery.
6. Good judgment.

PURE MATERIALS.

Without pure and reliable materials successful spraying is impossible. This applies to all commercially prepared insecticides and fungicides, especially the arsenites, such as paris green and Scheele's green. This means that success depends upon the chemical composition of the article and upon the proper percentage of some one poisonous active principle. Paris green has become the most important insecticide at present in use for destroying chewing insects. It is a comparatively cheap and effective poison when of proper strength and purity and if properly applied. During late years many serious complaints have been made against its variable composition. Until laws controlling the manufacture and sale of paris green are enacted in this State the fruit growers will have to rely upon the few simple tests they are able to make for themselves or upon the honesty and reliability of the manufacturers of the poison. The points which the grower can determine for himself are the following:

1. Paris green should be a dry and wholly impalpable powder. Guttiness and cakiness are evidences of adulteration.

2. It should have a bright, light, emerald green color. Dullness, and a light or faded color are indications of low grade.

3. To test the color, place a small quantity—what one can pick up on the point of a pen-knife—on a small piece of window glass which has been polished, clean and dry. Tilt the glass at a slight angle and tap its edge gently—enough to cause the green to run down, leaving a streak across the surface. The streak should remain bright emerald green; if whitish the sample is inferior.

4. Place a small quantity in a small glass vessel. Pour on a quantity of common ammonia water. If the green is pure it will all dissolve. If a residue is left, the sample has been adulterated.

HOME MADE SUBSTITUTE.

Because of the widespread dissatisfaction resulting from impure paris green, several substitutes have been suggested which can be home made, and which therefore possess the advantages of being of known composition. The most promising of these are perhaps the arsenite of lime and the arsenite and arsenate of lead. These mixtures have been used with more or less success. The formulas and directions for making them are given below.

The other materials used for spraying purposes in Illinois (copper sulphate, copper carbonate, white arsenic, sal soda, etc.) are pure enough for all practical purposes, as found in commerce, and need not be so rigidly tested as paris green.

PREPARATION OF MIXTURES.

Much depends upon the manner in which the spray mixtures are prepared. As in all technical operations, there is a "right and a wrong" way of preparing compounds or solutions for spray work. Even so simple an operation as the common mixing of paris green and water forms no exception to the rule. The difficulty increases as the mixtures become more complex.

In the preparation of paris green the powder must be thoroughly wet before it is added to the full quantity of water. The easiest way to do this is to put it into a jug along with a small quantity of water, close the vessel and then shake vigorously until the powder and water are thoroughly mixed. Then the wetted green may be added to the full quantity of water.

Little need be said upon the preparation of simple solutions. In most cases it consists in simply pouring the compound to be dissolved into the water or other solvent. As a general rule it may be stated that warming the solvent and powdering the solids hasten solution, and will therefore be advantageous when the solution has to be prepared on short notice. Stirring also hastens solution. In the case of copper sulphate the solution is heavier than water. If the salt is simply placed in the water, it will sink to the bottom and there a "saturated" solution will be formed around it, thus greatly retarding the solution of the whole mass of sulphate. The latter should, therefore, be put into a bag or basket and suspended at the top of the liquid. In this way the solution sinks to the bottom as soon as it is formed, and thus the sulphate is kept in contact with fresh water.

EMULSIONS.

Emulsions are mechanical mixtures of waxy or oily substances with water. Their preparation, therefore, involves the breaking up of the emulsified material into exceedingly fine particles in order to allow intimate mixing with the emulsifying liquid. This is accomplished by vigorous churning or agitation, which should be continued long enough to make the mixture permanent. The more vigorous the agitation, the less time it will require to accomplish the emulsion, other things being equal. This point is all-important, for if the oil is not thoroughly emulsified it will separate and float on top, not only reducing the strength of the solution, but leaving pure oil for the last spray from the tank. A good way to test the emulsion is to spread a sheet of tissue or other absorbent paper over the surface of the undiluted emulsion. Then apply a match to the wetted paper. If it burns, it indicates that free oil was absorbed from the surface. Therefore the emulsion was imperfect. Further churning is thus necessary. If the emulsion is perfect, the paper will absorb water and will not burn.

MAKING BORDEAUX MIXTURE

The proper preparation of bordeaux mixture is most important. If it is not properly made the mixture can not be kept in suspension without continuous and vigorous agitation. It is thus extremely difficult to secure a uniform application and in addition, it is more than probable that the compound so formed is not so active a fungicide. Bordeaux mixture is a complex and insoluble compound of lime and copper suspended in water. This compound seems to be rather unstable and for that reason should it be used only while fresh, or at least not over 24 hours old. The solutions, copper sulphate and milk of lime, should be diluted before they are put together. They should also never be mixed while warm. It is also essential to have all the copper in combination with lime, and for that reason a slight excess of lime is advisable. Excess of lime does no harm, while uncombined copper sulphate is very injurious to the foliage. The quantity of lime depends upon the quality of the rock from which it is made and thus varies in different localities. The prepared mixture should, therefore, always be tested before being used. There are two very simple tests, which can be performed by any fruit grower. The addition of a few drops of yellow prussiate of potash solution will cause a dark reddish-brown discoloration when there is insufficient lime in the mixture. When no discoloration follows such addition, the copper has all been combined with lime, and therefore the latter is present in sufficient quantity. If no prussiate is at hand, dip the end of a bright knive-blade or other bright steel object into the mixture. After a short time the steel will become coated with metallic copper, or "copper-plated," if insufficient lime has been used. If enough lime is in the mixture, no such coating will take place.

METHOD OF APPLICATION.

The mode of handling and applying spray mixtures depends upon their physical properties and the class of insect or fungous disease they are intended to combat.

Insecticides act in two ways:

(a) As a poison to be eaten along with the part of the plant attacked.

(b) By contact with the insect.

Fungicides also act in two ways:

(c) By direct contact with exposed mycelium.

(d) By destroying the germinating tube of the fungus before it penetrates the skin.

Thus it will be seen that in applying the mixtures either of two objects must be kept in view, depending upon the class of insects or fungi to be controlled. In cases (a) and (d) the plants or trees must be completely coated with the mixture, so that wherever the insect bites or the fungus spore germinates it will be attacked by the poison or the fungicide. There must be no breaks in the coating of spray mixture. For that reason, use considerable pressure and a fine nozzle in order to get the liquid issuing in the form of a fine mist. Hold the nozzle a little distance away from the leaves or fruit and apply only enough mixture to cover them with fine "dew-drops." Extreme care is necessary to accomplish this successfully, but it is highly essential for effective work. If the spraying is continued too long the fine drops will run together and run down and drip off at the lowest point, thus leaving the upper parts largely exposed. In cases (b) and (c) the spray acts by direct contact. It is therefore necessary to be sure that every part of the tree or plant is struck by the mixture. It is not necessary that the coating of the mixture be maintained. Rather the the reverse is often true. The spray has done its work as soon as it strikes, and therefore it does not matter if it runs off. Use, then, a nozzle which delivers the spray in a fine but direct stream so that the mixture will strike with considerable force. The only precaution necessary is to avoid waste and not allow the liquid to run down the trunks and thus saturate the ground around the root-crowns, where it will injure the roots.

In general, the following rule will be applicable:

Paris green and other arsenical poisons, Bordeaux mixture and ammoniacal copper carbonate should be applied through a fine nozzle as a fine mist and only until the fruit and foliage are completely bedewed.

Kerosene emulsion, kerosene-water mixture and caustic mixtures should be applied as a fine direct stream intended to strike with considerable force. Every part of the tree or plant must be struck by the spray, and dripping need be avoided only to prevent accumulation around the root-crowns.

TIME OF APPLICATION.

The time during which an insect pest or a fungous disease can be successfully combatted or prevented is in most cases extremely short. Often a difference of a day or two is sufficient to change success into failure. In spraying for the codling moth, unless the material is applied within a very few days after the blossoms fall and before the calyx lobes close, the spray will not prevent the apples from being wormy; for it is impossible to get the poison into the calyx cavity after that time. In spraying for apple scab, bitter rot, or any other fungous disease, the mycelium of which grows within the leaf or fruit, the fungous must be killed before it penetrates through the outer skin. The spraying material must be upon the plants before the spores of the disease germinate, and preferably before any spores are present. The particular time of application will vary with the different diseases. Repeated sprayings are often necessary, because new spores are formed and because the coating of spraying material may become damaged by the growth of the fruit and leaves, or be washed off by rain.

THREE TIMES.

The regular spraying of apples for the canker worm, codling moth and apple scab consists of three applications of Bordeaux mixture and Paris green. The first application should be made just before the blossoms open; the second, immediately after the blossoms fall, and the third, a week or ten days later.

The bitter rot of the apple is a disease concerning which so little is known that no definite recommendations regarding its control can be made at this time. It is probable, however, that if the treatment for apple scab (see above) is followed by an application of Bordeaux mixture about the middle of June, and another ten days or two weeks later, the damage from the disease will be considerably reduced. Later spraying may be needed, especially if the weather is warm and moist. If very late sprayings are necessary, the ammoniacal copper carbonate solution is preferable to the Bordeaux mixture, as it leaves practically no stain upon the fruit.

FOR BROWN ROT.

For the brown rot of the plum and peach apply Bordeaux mixture before the buds swell, just before the flowers open, when the fruit has set; and if the disease has been serious the year before, or if the weather is favorable for its development (warm and moist,) fruit is nearly full-grown. Then use ammoniacal copper carbonate every few days until the fruit is ripe. On stone fruits in full leaf, use Bordeaux made with three pounds of copper sulphate and five to six pounds of lime to 50 gallons of water. This disease can be more easily controlled if the fruits are thinned so that they do not touch one another.

FOR SCALE INSECTS.

For San Jose and other scale insects, spray when the trees are dormant, using kerosene-whale-oil-soap emulsion, containing 20 per cent of kerosene. This treatment should be followed by an application of more dilute emulsion immediately after the young scales hatch and while they are still crawling about the tree.

Grape diseases, such as black rot, ripe rot, downy mildew and powdery mildew, can be controlled by the following treatment: Apply Bordeaux mixture shortly before the blossoms open, soon after the fruit has set, and then every two or three weeks until it becomes necessary to substitute ammoniacal copper carbonate to avoid staining the fruit. The late applications of copper carbonate may need to be made every few days if rot has been serious in former years, and the conditions are favorable for its development.

Currant worms can be destroyed by the application of Paris green or some other arsenite as soon as the earliest larvae appear. If it becomes necessary to spray currants or gooseberries after the fruit has attained considerable size, use white hellebore in the place of Paris green.

For gooseberry mildew apply Bordeaux mixture just before the buds open; then use potassium sulphid every week or ten days as long as seems necessary.

For plant lice of all kinds use whale oil soap or kerosene emulsion, diluted sufficiently to avoid injury to the foliage.

For red spider and other plant mites use kerosene emulsion sufficiently diluted, to which is added one ounce of flowers of sulphur to each gallon of the mixture.

Q. Is the Bordeaux mixture equal to Paris green?

A. The Bordeaux mixture is a solution used for the protection of plants from fungus diseases. It differs from the Paris green in that it is not intended for insects.

Q. Do you mix the two?

A. Certainly. For the early spray where you fight the disease, apple scab, and the codling moth and the bud moth and several insects that make their appearance in the springtime, use the Paris green in the Bordeaux mixture. The Bordeaux is used at that time upon our apples for protection from the apple scab, the worst pest we have in this country in our apple regions. Have the Bordeaux made according to the method I gave you and follow this matter up. I want to set you thinking. You must attend to the details until they become a part of you. Make it a part of your business to become acquainted with these few simple things and then use the head, so as to meet any of those local problems that nobody but yourself can grapple with.

Q. How do you mix the Paris green?

A. The Paris green is put into the Bordeaux by first mixing with water. Four ounces to 50 gallons of Bordeaux is sufficient for all chewing insects. We have a combined solution, four pounds of copper sulphate, four pounds of lime, 50 gallons of water and four ounces of the Paris green, and that gives us the Bordeaux-Paris green mixture, a solution intended only so far as the apples are concerned, for the early chewing insects and also the apple scab or like diseases.

Q. In putting the lime in, do you put it all right in?

A. All the solutions should be strained before going into the tank where the lime itself is.

Q. What do you strain with; burlap strainer?

A. You should use a wire gauze strainer, 20 wires to the inch; never burlap, it clogs the nozzles.

Q. Can you see the spores from which these diseases germinate with the naked eye?

A. No. sir; but you can see the result with the naked eye after the spores get started, but in this particular case supposing this disease is the bitter rot and tonight it germinates and tomorrow if you do not spray or at least if you do not spray before the next day you might just as well keep the machinery at home; it will not do any good.

Q. Do you spray while in bloom?

A. No, sir.

Q. There are those who advocate it.

A. There are some, but as a rule it is not a good thing. We want the fertilization to go on uninterrupted.

Mr. Hinkley: Do you apply the spray when the trees are wet with rain?

A. No, sir; not unless it is a fine, misty rain and you have got to get right along.

Q. It seems to me you would lose a good deal of the strength?

A. That is true; but you have got to keep ahead of the disease.

Q. Would you use the same solution on peaches as on apples?

A. It depends on what you are after.

FRIDAY AFTERNOON.

The President: Mr. Tanner is detained at home by sickness; the question of "Farm Telephones" will be omitted.

If you have any questions on spraying, now is the time to ask them, before taking up the regular program.

Mr. Hubbard: In our neighborhood we use London purple as we use Paris green. Must we use a different ratio?

A. London purple is more variable; my advice is to do away with London purple. I have seen so many bad effects from its use I would not recommend London purple. It is more variable. It is more caustic. If you use it you must use more lime or the arsenate of lime. I referred to the fact that the white arsenic is a chemically pure substitute. You can take one pound of the white arsenic, four pounds of lime and four gallons of water, and boil together for 45 minutes and you have a composition known as arsenate of lime; or sal soda and use one pound of white arsenic and one pound of sal soda and boil 15 minutes and you get arsenate of soda. These two compounds are better insecticides, all things considered, than is the pure Paris green. It is better because you can hold it in suspension longer. You can get it more evenly distributed. It is pure white which is objectionable, and you must be very sure to be cautious and not allow any of the solution to be left in the vessel where any livestock or members of the family can get access to it. The soda solution will go just as far as the chemically pure Paris green and costs you one-quarter as much as the Paris green.

Mr. Alexander: What is fungus and its source?

A. The term "fungi" is the plural for fungus and is a term used to designate a low form of plant life. They feed upon other plants. Referring to the low form which feeds upon the other plants, the apple scab, you find a little blotch on the side of the apple, and later on you will find a brownish spot, and we have thousands and thousands of them feeding upon our plants and those fungus diseases they come from a germ or a seed which we term a spore. You have got to get certain conditions before it can germinate. Take the bitter rot. While the disease on the plant is in the dormant form it is very difficult to do anything with them. A solution that will kill this disease germ will kill the plant also, as a rule. Wait until the spore has germinated. Spray before the blossom opens. If they have not all germinated by that time, the majority will at the time the petals fall. If the season is backward and the development is put off, make a third application.

Mr. Aiken: If I have an orchard of 100 trees five years old, how many times shall I spray them and what will it cost me?

A. How many trees?

Q. One hundred.

A. How old?

Q. Five years old.

A. It all depends on you, sir. If you get a chemically pure material and the work you do.

Q. Do you spray before they commence bearing?

A. Yes, sir; you can't get a good tree unless you have good foliage. It is just as important to spray before the fruit is there as later. You can't get a tree to produce good fruit unless it has been developing symmetrically and has good foliage. It will cost you, providing you pay attention to the six points I referred to you this morning and you give due attention to those points, it should not cost you over 7 cents a tree for three applications.

Q. I have to buy my apparatus.

A. All you are figuring on is the interest this year. If you buy a good one it will last for ten years, so you will have to figure on the interest. It will cost you approximately 7 cents a tree. Am I too low? There are a good many fruit growers here.

Mr. Hinkley: That is about right.

A. Thank you, sir. I have seen a great many that spent 25 to 30 cents a tree simply because they didn't give good attention to the business side of the work. If a man will not give a little thought to the care of the trees better not grow them.

Mr. Hinkley: Can you tell what climatic conditions are most favorable for developing the spores of the bitter rot?

A. ———————— of Missouri in his experiments claims that a hot, dry atmosphere was most conducive to the development of that disease, and the experience of nine-tenths of the people watching the disease for the last ten years think that a hot, moist atmosphere is the best, and we find in the disease of agricultural plants the more moisture in the air the more germs in the air.

Q. Did you have any trouble with rotten apples last year?

A. Not last year. Two years ago the bitter rot was very bad in southern Illinois. There were no more spores of the bitter rot than this last year, but there was ten times the amount of damage two years ago. I knew a man in southern Illinois, Mr. Brokoff, who sprayed his orchard under my direction. He sprayed nine times and had them apparently covered with the Bordeaux mixture, and yet at the critical time the rain began to come and the spores that we had apparently killed gradually appeared on the fruit, the disease started and the whole magnificent crop was gone. You can get the pamphlet, "Field Work for Bitter Rot," from Champaign.

Mr. Casper: You spoke about spraying eight or nine times in order to circumvent the spores. What is the effect of the later spraying on bearing trees? Don't it make them look bad?

A. We find the late spraying does russet the apple to a certain extent, but it looks a good deal better than the disease. I don't know of anything that looks worse.

Q. I last year failed to spray but twice on account of the effect on the apple. There is something very peculiar in the effect of the Bordeaux mixture on the apple and all the authorities I have read say late spraying is liable to disfigure the apple. Two years ago I sprayed some apples just as the last blossom left. They had no spraying previous to blooming. They were then full of bloom and I went down with the spray pump just as the bloom was off and I never saw a set of worse apples. Last year I sprayed before and after blooming and we had little disfigurement of the white apples?

Q. There are two or three vital points in the question. In the first place we ought to inquire how he made his Bordeaux mixture?

A. He made it every way and saw no difference.

Q. Did you try some Bordeaux mixture with the copper sulphate diluted to the required amount?

A. Yes, sir.

Q. Did you spray some trees with the solution until the foliage and fruit was covered, did you do that?

A. There never was a man that will do a job of that kind all over a 25 foot tree and using 24 feet of hose. With a big tree you need 30 feet of hose. You will not stop until you see some drip and I do the spraying myself and I know.

A. I would not be here this afternoon to talk to you unless my arms and my back had carried the bamboo from sunrise to sunset in some of the best orchards in this country. I commenced when I was 15 and I have been doing it ever since, and the last few years I have been telling the other fellow how, and have enjoyed it better. It is not necessary to see the spray. By the time you have sprayed this season with that point in mind you will move the pump right around the tree. You have to learn how to do it.

Music, "The Courtship of the Bee," Bemberg. Mrs. Daisy Force Scott.

President: The next on the program is a paper on "The Silo" by Mr. E. N. Cobb, of Monmouth.

Mr. President: I might say, dear friends. I used to be a resident a great many years ago of Winnebago county. I had one good habit. I learned to wear socks, and got some Rockford socks here 24 years ago and have worn them—worn socks ever since. I have often thought in years past I would like to apologize to the county of Winnebago for something I did when a young man. I married the best girl the soil of Winnebago ever produced. I led this young lady to the alter in 1876 and I have never led her a foot since.

The great value of the silo is not fully appreciated by our farmers and in my correspondence and institute work I have found that the impression generally prevailing is that they are very expensive and that there is some mystery in their successful construction. This is not the case. There are a few simple rules to observe. An airtight building of sufficient strength to withstand the lateral pressure which is very great; a foundation wall such as any good building requires and some kind of a roof. Regarding the first rule to have silo airtight, it is not necessary to be airtight when empty; any material used in building that will swell when the wet sappy ensilage is put in silo, sufficient to close cracks is all that is necessary. Material of this kind is flooring, 2x4 and 2x6; good stock boards will also do for the same. The 2-inch stuff is used in building round silos and the round silo is the best form to build; it is the strongest and easiest to construct and costs less money than any of the other styles of silos.

I am, perhaps, in a position to give as good advice in silo construction as any man in the country, having used them during the past 16 years in several states, and have seen all kinds of silos, all kinds of materials used and all styles of construction, from a hole in the ground to the costly brick structure. I have found that great cost does not necessarily mean success in the silo. I have fed as fine ensilage from an excavation that cost only labor removing earth as from a silo that cost $1,000. The few simple rules above named can be followed in low cost structure just as well as in the expensive building. The cheapest form one can put up is the round silo, built of 2x4 pine if you are in the pine lumber belt. If you are where hemlock is cheaper than pine use that. If tamarack is the cheapest local lumber, use that. If spruce is your cheap building material use it, or in the coast country west of the Rockies use redwood. It is just as good as pine, no better. If you are in any of the above localities but are shy on cash, but have plenty of muscle and energy, go into the ground as deep as you wish. If the location is well drained no walls are necessary, just run in ensilage; but if there is danger of water plaster on dirt with cement if dirt will permit, if not, lay up a thin wall and cement.

To build a round silo of 2x4 stuff, get your lumber and have it dry and free from loose knots; see that the edges are straight, so that when walls are up edges will touch evenly the entire height of silo. In a circle of 14 feet or more it is not necessary to bevel the lumber to fit the circle; it is better not to do so, because the lumber will dry out more quickly when ensilage is removed, which tends to prolong the life of the silo by checking decay. In case beveling is done, don't bevel the entire stick's width, only take off bevel from center of timber; this will leave other half slightly separated from its mate, giving air a chance to dry wood. To the novice, an empty stave silo with its staves showing daylight shining through cracks from top to bottom is far from an air-tight building, but one has only to tighten up hoops snug and go ahead and fill. A stave silo is like a leaky barrel; it only wants hoops driven tight to make it as tight as ever. While the silo has not hot water it has something just as effective—ensilage, which is 80 per cent water or sap and heats up to 180 degrees; every crack is shut tight. To build a stave silo first decide on size of silo, then get the material most abundant in your locality; any lumber that will not warp is suitable; have it as dry as possible. If your silo is to be above 20 feet in height, buy lumber of two lengths; for a 24-foot building get 14 and 10-foot stuff; or in a 26-foot silo, 12 and 14-foot lengths. Get your stuff on the ground during some dry, hot days, laying it closely like a floor. Then take an old broom or a whitewash brush and a bucket of coal tar (this is called gas tar and can be bought for 3 or 4 cents per gallon at gas works) and paint the lumber, not scrimping the amount, let lay a day or so and then turn up another face of the lumber and again give it the gas tar paint. Continue till all sides and edges are painted. Gas tar has been found to be the best preservative of silo walls yet found, and I may add that for rough work such as farm gates, corn cribs and board roofs, it is not equaled by many of our many paints. If tar is too thick to spread easily, thin with gasoline. While our lumber is drying we will put in silo foundation. We must decide where to build, and the best rule is to build just as near the animals' mouths as possible, to save the work of feeding, at gable end of the barn or shed is the best place. To lay foundation, drive a peg in center of ground selected for foundation, take a fence board, bore a hole in end, slip over peg, then at half of distance of diameter of silo slip a pin or bolt that will mark ground as board is moved around, after this mark is made, set pin out as far width of foundation trench is to be, which is about 16 or 18 inches. Now dig trench 18 or 20 inches deep, then fill up within six inches of top with small rocks, brickbats or very coarse gravel, over this pour thin cement. After this part of foundation is complete, start wall six inches from outside of trench, leaving a six inch jog, that jog is to fool any rat that may wish to explore contents of silo, he will dig to the concrete work and then stop, not knowing enough to follow the six inch step to outside of concrete. It is better to finish the narrower wall with flat rock or brick, build up eight or ten inches above ground level. The dirt should then be thrown up against wall on outside, even with top of wall to turn water from building. The inside circle or silo bottom should be of dirt only. Many people put down costly cement floors, only to find that a large amount of ensilage is spoiled each year. We do not know the cause but we know that the last foot or 18 inches of ensilage on cement has a very offensive smell and is not relished by cattle, while ensilage on dirt can be fed to the last basketful. I am speaking from 16 years' experience when I make this statement, have fed from many cement bottoms and always with the same result. A sill is not necessary but I always use one. To make the sill, take ten inch width lumber, one inch thick and cut in segments of circle of wall, cut enough of these to make sill three or four inches thick, bed first in layer of mortar, then give a coat of gas tar, then lay on another course, breaking joints, nail down to lower layer. Continue laying, tarring and nailing till desired thickness is reached. We are now ready for the tarred staves or two by fours. But you may wonder how to make a start, what to use for fastening hoops and silo with, and what to fasten staging to. To do all of this requires four timbers of hard wood, four by six inches in size and as high as silo is to be. Before we put up these timbers, or we may say frame of our silo, we bore enough holes in these sticks to receive the hoops. These holes are in pairs and are two and one half inches from what will be the inside edge of silo. Holes are to be three inches apart long way of timber. Now we will lay off our circle, finding one quarter of distance where we stand one of these sticks and secure it by toe nailing to sill, again measuring another quarter distance, set up timber continuing till we have the four up, we at the same time brace these pieces well with fence boards or two by fours always keeping out of inside of silo. After we have braced well, we set two by four pieces on outside of silo opposite the four by six timbers, about three feet from them, or as wide as you wish to build scaffolding, nail lumber from these two by fours to four by six pieces at intervals of about eight feet on which scaffold lumber is laid. A silo 25 feet high will require three of these stagings. Now we are ready to build or set up the staves. Three men or boys do first rate. For this work the necessary tools are three hammers and plenty of sixty penny wire spikes, forties will do in case two by fours are scant four inches, as they often are. Now set up one of the two by fours edge against a four by six piece about every four feet, the men on different stages will attend to nailing up to top of silo; to nail the 2x4 stave to sill with ten-penny wire nails. Continue setting up and nailing; if the upper half of staves do not want to follow circle, strike outside wall with heavy hammer, maul or back of an ax, and the right curve will come. After setting all staves to last three or four feet (and this space should be at place where doors are to be) make arrangements for doors. The doors are only the wall of the silo cut out on bevel, and the pieces thus cut out nailed together with some barrel staves, the staves giving the short pieces the necessary curve to circle; the bevel must be on inside of silo, so that when doors are set in place the ensilage will press them in place. No frames for doors are necessary and no fastenings or hinges. In cutting out the doors they should be numbered so they will be put in same place each time. A door 18 inches by 2 feet is large enough. To cut out these places it is best to cut side bevel piece while the 2x4 is on the ground. To do this, bore a hole in center of the 2x4 on right bevel and cut with a tenant saw far enough to allow larger saw to enter cut; when piece is cut out, tack in place with some small nails. Now finish up silo walls and then the man in silo will have to cut out the lower door in order to get out; if on outside can cut his way in. Doors must be about three feet apart to be handy in taking out ensilage. The hoops for this silo should be of $^5{}_8$ round iron; each section of hoop should be long enough to pass through two of the 4x6 timbers and threads should be cut six or eight inches on each end of hoops so as to take up any shrinkage of silo. Cast iron washers are necessary to bear against the 4x6; light washers will sink into the wood when the silo is full and pressure bears on hoops; hoops should be placed as follows: First one near bottom of silo about six inches from sill, the next two feet higher and each alternate hoop six inches higher than last put on. This is for 18, 20 and 25 feet in diameter silos; smaller ones may use less hoops and even $^1{}_2$ inch hoops will answer. Many people are now using Page wire fencing. The Page company are making a special fencing for this purpose, to put on this style of hoop. The ends are passed through 4x6 hardwood pieces and ends well secured by bending half way round the timber and stapling, then holes are bored near top and bottom of these sticks for take-up rods to pass through to tighten the fencing round silo. Our silo is now ready for the roof. I neglected to state in the proper place that the 4x6 pieces are flush with inside wall of silo and are a part of the wall.

The roof of silo can be built of boards put on hip roof style or a cone shaped roof can be put on and shingled. Metal roofing is used by many, while many have no roof: I have used silos without a roof and saw no bad results.

Another cheap silo is built of stock boards, flooring or other lumber. Where a man has a large barn he may want his silo in one corner of it. The square silo then is his best form. To build this take 2x10 inch planks, lay them down in square shape like a door frame, letting the corners lap and spike at corners so as to make the corners four inches thick. Then saw pieces to bind across corners. These pieces should be three feet long. Spike well. You have now got the frame of silo finished. These frames are to take the place of hoops on round silo. To start to build pile on top of each other all of these frames just where silo is to be built, then take lumber (flooring, stock boards or shiplap will be good) go inside of frame, stand up boards at each corner and nail bottom of boards to sill or to the bottom of frame; then raise the top frame to the upper ends of standing boards and nail. If you want a silo deeper than one length of lumber, let first course of lumber reach to center of the top 2x10 frame, the other course will then have room for nailing. Now raise next frame up within four feet of upper one and continue to drop down three and one-half feet, three feet and two and one-half feet, and last frames two feet apart. Now board up inside, after which, if stock lumber has been used, put on a heavy grade of tarred paper then break joints and put on another layer of lumber. If flooring is used one thickness will answer. These silos are cheap, good and lasting and being in barn require no roof.

Silos, like everything else we build, cost as much as we may feel like spending on them. One man is satisfied with a barn costing $500, while his neighbor will spend three times as much on the same sized building. Where one has fine buildings it may be well to harmonize by having a fine silo.

The great value of ensilage is the succulent property. I have often seen it stated by our eminent authorities on feeds that the silo does not add to the value of our corn crop or such crop as we put in our silos. I refer all such people to Old Brindle during the winter months when she is receiving a liberal feed of juicy, warm ensilage, while the cow belonging to the fellow who says the silo don't add value to the crop is eating dry corn fodder and wasting fully one-half of it. Our daily milk record of individual cows shows us that value is added in September to be fully realized on in January. Ensilage is the link between one green pasture period to another. It is our pastures for winter. During past grass season we have given both ensilage and bluegrass careful tests and in every test our cows proved that ensilage was a superior food over grass, and any schoolboy can easily figure what our grass pastures cost us. When an acre of good corn in the silo will feed a cow 12 months, and every day of that period finds the cow well filled and contented, can we say even that our cow is contented five months on bluegrass pastures? Our milk record of daily yield of herd shows that our pastures will keep cows doing well for the months of May, June, and a part of July, after which they would rapidly shrink if some other crop were not fed them. While ensilage is valuable for the dairyman, the stockman can get as great value by feeding it to beef steers, stockers, and hogs, sheep or horses. Every kind of farm animal is fond of it, and there is no cheaper source of feed known in the corn belt. While it is cheap, it is a great promoter of health and growth, together with its being a handy feed. The great objection to ensilage in the past has been the cost of putting it in the silo, but at this time, with the low-down wagon, the corn binder and improved cutting machines, we have reduced the cost in our own case from $1.25 per ton in labor to 33 cents, and I have seen reports from several farmers who have done as well.

We have found that our cheapest ensilage is always that which we put up with large capacity of cutter and a good force of men. We never could cheapen the labor force of running a limited number of men and a small cutting machine. For either fodder, green crops or hay, always get one of more capacity than you really need; you then have a machine with reserve force, and one with heavy castings, frame and shafting. If you want to crowd it you can do so, feeling safe in the strength of your machine.

To equip your wagons for hauling the corn to cutting machine flat racks are best. Deck them over with boards so that men can be free to walk about it with nothing to stumble over. Be sure to use low down wagons, they save much heavy lifting. We have metal wheels that fit our ordinary farm wagons so that one set of running gears answer for both high and low wheels. To make the filling of silos easy and to insure the corn to be distributed evenly in silo have a large funnel made of galvanized iron that is somewhat wider at mouth than carrier is at lower end; have it 12 or 14 inches in diameter with some hooks riveted on outside to hook each sack carrier to. This carrier is made of gunny sacks sewn together, making it long enough to reach to the bottom of the silo, so that when cutting the ensilage, one man can lead this sack carrier around silo, saving a great amount of work with pitchforks. Always keep the outside edge of silo four feet higher than center; do all tramping around edge. It is not necessary anywhere else. When silo is well filled level up or round up well and by running up some wet oat or wheat straw and covering up ensilage four or five inches thick it will keep an indefinite period, or one may begin feeding at once if necessary. The power for running cutting machine may be a tread, a sweep horse power or steam. The latter is the best. At time of cutting the crop a threshing engine can be hired at a low cost. With us, we have a stationery engine in creamery building that, by using belts and shafting, we can fill all of our silos with no moving of engine. The power for running cutters with bucket carriers is not as much as the blower style. There is about two horse power difference in the large machines and somewhat less in the smaller sizes. The cutter we use cuts a ton and one-half of green fodder in six minutes and an eight horse engine does the work easily. Knives are 16 inches long and we use two sets so that we can grind one set while the other is in use.

Q. Do you heat the tar?

A. You don't need to if you do the work in the summer time. If it is too thick dilute it with gasoline. We have never heated it.

Q. Do you have much success putting in sorgum?

A. Yes, sir. If anything it keeps better than corn. We alternate one load of sorgum and one load of corn.

Q. Is it good feed for horses?

A. Yes, sir. It is good for chickens. We feed it to the hogs.

Q. Do you cover the silo?

A. No, sir.

Q. How long will a silo last?

A. I have used ensilage for 15 years.

Q. Is there any provision for drainage?

A. No, sir. It is not necessary. I never saw a case where it was necessary.

Q. Do you drag your corn or plant with check?

A. We drag our corn.

Q. How are stone silos?

A. All right, but it is expensive unless you have some rock you want to get out of the way.

Q. You set them close to the barn or inside?

A. Just at the gable end of the barn we have two. Water will not damage it.

Q. Does yours have a blower to it?

A. No, sir.

Q. Won't the silo dry up?

A. Yes, you can see between the two-by-fours. That is one of its advantages.

Q. How much damage does it do to the ground outside?

A. None at all.

OPEN PARLIAMENT FOR DISCUSSION OF FARMERS' CLUBS AND OTHER MATTERS THAT MAY COME BEFORE THE MEETING.

Mrs. Virginia Meredith of Minnesota college was called on for a short talk.

Mrs. Meredith—If the chairman will be kind enough to tell me what I am to talk about, domestic science or to the beef men. Possibly you might be interested in knowing about our school of agriculture, as the gentlemen mentioned that first. Minnesota has a school of agriculture. Every state has a college of agriculture. The school of agriculture in Minnesota is without a special grade. Boys and girls from the home who have finished the ordinary branches in the country schools are able to enter this agricultural high school. There are at the present time enrolled in the school about 450, 130 are girls, the others are boys. The girls were admitted into this school on request first of the boys in the school. Why is it you have been hearing about people leaving the farm? I think the reason is found in the dissatisfaction of women with the conditions on the farm. The boys who went to the school of agriculture got new ideas and better ideas and more respect for farming, and when they came home they found the girls on the farm did not feel that way. The next thought was to bring the girl into the school of agriculture and see if they could be given a training that would make the girl care for the farm. What are we doing for the girls? The girls take much of the work with the boys. All the work in elementary agriculture, plant cultivation,horticulture, elementary forestry, dairy husbandry an other subjects. The girls take work in the dairy with the boys. The testing of milk, feeding the right rations for the dairy cow and the girls also have instruction in animal husbandry, the beef breed of cattle, the characteristics of sheep and swine. We are not trying to make farmers of them, but we are endeavoring to give them enough instruction, enough insight so that they may appreciate and understand the farm life, be in sympathy with it. Sympathize with the man who is doing the farm work. They go farther. They have special classes in home economy. We have most excellent instruction, covering a three years course. Girls come there from their homes who have never worn a thimble. They say, oh I can sew without a thimble. They begin at first with basting, then they hem, put in placket holes and do all the rudimentary work. When they first come they say I just hate to sew. And after a while the girls learn to draft and then to make a dress. She is given instruction in choosing fabrics. All of these things enter into the household economy. She is given a course of lectures on home administration, the fitting of the individual for society, to keep clean, keep healthy, how to introduce!and how to sustain yourself in conversation. We have the richest sort of social life—350 boys and 125 girls. We allow them to come together on the social occasions under the best conditions. We do not keep the girls away from the young men, but teach them how to hold themselves with young men. The parties are very entertaining. This personal fitness for society and the personal training in social usage carried back to the farm home will enrich the home life, and the social life on the farm instead of being so sterile will become richer and so remove one of the reasons why the girls and women are dissatisfied with conditions of the farm.

Going a little farther is the management of the home. This morning we had a little discussion about work, and I ventured to remark it was wrong to have washday on Monday. I think it is wrong to put washday on Monday. We will allow Monday to gather up the threads that have been loosened over Sunday and prepare for wash day on Tuesday and so remove the dread that it always causes on Sunday. There are a great many things along the line of home management—how to select furniture, carpets, and how to have everything in the house comfortable and suitable, because we have all seen a country kitchen that is delightful and the same house will have a parlor that is horrible, because of the things in it. It is a mistake to endeavor to ape expensive city houses; but bring out the idea of the farm house, make the country house a type of its own. The girls have a course of lectures on home economy. Each girl has her examination in this subject. Each girl is required to carry a family of five or six through the year on a certain named income The girl has to buy food suitable. She knows nutritious foods and can select a dietary that will keep her family in health and not very expensive. She has to learn how to select and replenish the household store, and she must look out for illness and lay something aside for the rainy day and at the end of the year she has to account for it all. The girl that has gone through that experience has been made to think along several lines. One girl started out bravely. She had a family of six and $1,000 for the year. She had lived in the country and had no idea of what an income was. Along about February she thought she never could get the family through, and she concluded the best thing to do was to have one of the boys drown while he was skating and the result was the body was never recovered and they never would have to have a funeral We didn't recommend that.

This of course teaches the girl to think about the things on the farm. There is no reason to think that a chicken which we have raised on the farm or the eggs and which are put upon the farmer's table is worth any less on the table than on the merchants table in the city. Milk, butter, vegetables and fruit is worth as much on the farmer's table and in his cellar as in anybody's house, and many farmers think they have a poor income when they are really living well. This makes the girl think. She learns about the fields, the flowers, the cattle; makes her see the farm as she has never seen it before and gives her a new interest. I often say to the girls, go home and come back; how does the farm look to you? And they will say it looks as it never looked before. I saw things I never saw before. A girl is made to draw a plan of the farm when they first enter. The first year they can't remember the shape of the farm and fields, and which are in wheat or oats, and they have to write home to find out. When they go home the next time they see the farm and then they know exactly.

This is a six months' school. They come October 1st and stay till the 25th of March. They enter into the farm life on going home and apply the things learned in the school and live the six months on the farm and come back in the fall. When you send children to school nine months, they lose their identity with the farm. They are drawn away from the farm but in this way the school is in connection with the farm and the experience comes to reinforce the six months' term. I believe in the plan of the Minnesota school. I believe we have the right ideas and in giving to the young men and young women this idea of a farm home we have given them a splendid ideal. Perhaps I have not said the right thing, but if there is any question I would be glad to answer it.

Chairman—We will have now an experience meeting, so called. I will call on several and I would like to have talks limited to five minutes, and at the end of that time the gavel falls.

Is Mrs. Dunlap present?

Mrs. Dunlap—What is my subject? A. Domestic Science.

I assure you that when I start upon the subject of domestic science or anything pertaining to that, it is hard to say enough in five minutes when I want not less than an hour; but I feel after this meeting here in Rockford, as I said yesterday, that instead of domestic science being on the first floor, it is clear up on the top, in the upper story, for that is where it was yesterday afternoon in our meeting, and when I see the interest that is manifested here in our meetings, in the morning meetings by the farmers' wives and by the town women, I realize that we have very much to be grateful for and that it portends much for the health and happiness of the people of this State in the near future.

The women of our meeting this morning stood for three hours and said they could have stood for another hour and talked on this question of domestic science and so I know they are interested in this matter, and now while you are doing so much to educate the farm boy in raising the corn and in growing cattle and knowing how to give them a proper food ration, I assure you there is much going on in this State towards education of the girls, and as a gentleman said on this platform the other day they were going to try to interest every farm boy in this State in the next world's fair at St. Louis, we want to say there is a movement in this State to interest the farm girls in the St. Louis exposition, and we want the products of of this State displayed and we want them cooked by the Illinois girls. It is just as important that the girls should know how to get the food prepared as it is for the boy to produce it.

I assure you that many are now interested in Domestic Science work in Winnebago county as a result of this meeting. A lady said to me today, "I will open up my home and kitchen to the Domestic Science society any time there is one formed here, and that means a great deal, for she is a woman with a large home and a nice kitchen. I just came from that kitchen with its every convenience and well arranged and I thought, what could not a club accomplish in that kitchen, and so I hope you will consider it and go home with the thought firmly in your mind that you will do what you can individually towards bringing this into your own county and neighborhood. I thank you.

Chairman—If Senator Dunlap is here we would like a few words from him.

Senator Dunlap: Mr. Chairman—I think that is very unkind to call a man after his wife and show the difference between the woman and the man on such occasions.

I don't know what the chairman called me out for, but at the present moment I represent the farmers of this State as well as the manufacturer and citizens of the cities. Generally in this representation of Illinois at St. Louis exposition there are two purposes. One is a commercial purpose to exhibit different manufacturers products and the different products of the soil and try to keep our attention to the products at home and for the purpose of displaying to others the various products of the State. At Paris, the United States government took a special interest in introducing her products, and I think for the State of Illinois the results will go to show that the money was wisely expended. The exhibit of American products and especially of Illinois products at that exposition was such as to attract the attention of the foreign people. I have met a number of American gentlemen who traveled through Europe and have afterwards said one of the first things noticed in almost every city was the great display of American products. The new process of cold storage is bringing about this condition of things. They wondered how it was possible for us to keep our food so or was it that their fall was our spring and our spring their fall and while it was spring with them it must be autumn with us. By January or February their fruit is all gone except what is grown under glass. Grapes, peaches, pears and apples are grown under glass and this fruit is away beyond the reach of all classes, except the wealthy class and in the latter part of March, strawberries were sold for 30 cents each in the market. I observed some very nice ones and in company with another gentleman, I called on the proprietor and talked the matter over and asked him if he found much of a market, and he said they were sold upon order, and this special lot were to go to the Countess Castellane so you see that is a pretty good way to get rid of the Gould millions. Apples were from 20 to 30 cents each. I was in the household markets of Paris on the second day of January and peaches grown under glass were sold at $1.40 each. This shows the possibility of a foreign market to the American who is willing to spend a little in exhibiting the American apple in foreign country. After January the markets would be at the mercy of the American shipper if they do not put the tariff up. We can show to the foreign people how they can procure American products at much less than their present cost.

The exhibit at St. Louis is for this purpose. It is for the advancement of agriculture in the State of Illinois and showing to our own people there are many uses to which corn and other products can be put and in that way tend to increase the consumption.

Now Mr. Shammel has shown to us how to increase our yield two to five bushels to the acre. If we can retain the price and increase the sale we are all right. Mr. Shammel told us they are breeding corn for different purposes. They are breeding for corn that will have a larger proportion of protein, another kind of corn will have more oil and fat producing food. The breeders will select the seed corn with a view to what they intend to feed for, dairy or beef, and you will see by the label of some of our brands of whiskey that some of it is adapted for fat men and the other brand is for increasing fat. So you see the idea may be worked out even in such things as that and the idea is a good one. The breeders of stock in Illinois that have become famous will have a chance to maintain their supremacy and increase it, and extend their breeds beyond the confine of Illinois and of the United States, and so the expositions are of value commercially and educationally, and I hope the farmers of the State, the live stock breeder and the corn grower, the horticulturalist and the producer of new grades of corn, and everything in which the farmers of Illinois are interested will take an active interest to make the exposition a success for themselves and Illinois.

Honorable David Hunter called upon, but was not present.

Chairman: Professor Kern who has helped us very materially in making our institute a success.

Professor Kern: I will not come to the platform. I only wish to voice my heartiest sympathy with what has been said on the training of the girls. It was my pleasure while in Ohio to visit the schools where girls are taught to become housekeepers, and I have always insisted that if it was right to train the boys it is right to train the girls. I have always talked it and I am hoping every public school will give less time to Latin, etc., and put more on these things, and on the fitting of our girls to become the wives and home-makers for the coming generation. I am interested in the work of the Wisconsin and Minnesota schools. I am glad Illinois is beginning to wake up and take a front seat with the other states.

I am a crank on one thing and I believe if we set about it wisely we can bring about the evolution of the country school so that the boy and girl of the country district can obtain the training of the boy and girl of the city school.

President: Mr. Frisbie.

Mr. Frisbie: Mr. President, Ladies and Gentlemen—I think it is not very kind of the chairman to call me up, and as I am no speaker, I demur.

President: I know you can work, now what can you say?

Mr. Frisbie: I am proud, more proud than ever I was before, of belonging to such a fine class of people as this meeting has shown the farmers to be. I am proud of belonging to a class of people connected with a public meeting of this kind that stands for everything that is for advancement of the home, every material thing that is for the up-building of this great Nation of ours. I know the farmers have done in the past their part in support of the flag. I know they will do their full part in the education of the children that are to come and in the future support the flag. It was among the farmers that the flag was first raised on the public schools throughout the country.

Through the work of the institute the advancement in our country schools has been marked and I believe the sentiment is growing, and I can't voice it better than a gentleman who has no children of his own, and who is a large tax payer. He told me the taxes he most cheerfully paid were the school taxes, because the school children would some day be the law makers, but he said he did object because his school was a small school, that they had six or eight scholars, and because it was small the directors thought it was not entitled to a high priced teacher. This he considered an absolute waste of the public money. Now a high priced school teacher may be a very poor teacher and a low priced teacher may be either very poor or excellent, but as a rule teachers as well as manufacturers and men who work receive wages commensurate with their ability, and consequently he did object to what he considered an utter waste of taxes along that line, and he was glad to see the farmers waking up and wanting better schools and taking care of them. He said he didn't care how the school tax was increased provided he got returns for his money, but it did make him mad to pay for something he didn't get. I don't wish to take up any more of your time except to say to the strangers among us, we were very glad indeed to welcome you. We are glad you came. We hope you will come again, and we hope that whenever you see a resident of Winnebago county or of northern Illinois in your future meetings you will remember you see a friend, a person you can depend upon for anything they can do to advance the work in every way for education and good citizenship.

President: Parties named as members of the Boys' Corn Committee: W. H. Stevenson, University of Illinois, Urbana; John R. Clisby, Arcola; A. W. Jamison, Peoria: Will H. Young, Athens; John T. Galbraith, Carbondale.

President: The people of Rockford have been very kind to us, and I don't know just where their hospitality would end if we stayed with them many more days. I have a communication to read to you from the Rockford Railway, Light and Power Co.:

ROCKFORD, ILL., Feb. 21, 1902.

To the Illinois State Farmers' Institute:

GENTLEMEN—We hereby tender you the use of our lines Friday, Feb. 21, 1902, between 3:30 and 6:30. Badges will be honored for passage on all lines between the above named hours.

Very truly yours,

T. M. ELLIS, *Gen. Manager.*

This includes a ride all over the city and you can also take the trip to Belvidere if you so desire. All not having badges, among the delegates, can get them by coming down here to the front of the house.

Report of Committee on Resolutions, by Mr. Frake:

WHEREAS, The promotion of the farming industry of the State can be most speedily and effectively secured through the study of the Elementary Principles of Agriculture in the public schools; therefore, be it

Resolved, That a committee be appointed by the president of the Illinois Farmers' Institute to present to the next General Assembly such a measure as may result in the introduction into our public schools the study of Elementary Principles of Agriculture, with the hope of getting our sons and daughters more interested in the development of the agricultural resources of the State.

WHEREAS, The officers of the Winnebago County Farmers' Institute, the citizens of Rockford and the county of Winnebago have made such complete and satisfactory arrangements for the seventh annual meeting of the Illinois Farmers' Institute, and

WHEREAS, The attendance and interest manifested in the papers and discussions have been exceedingly gratifying; therefore, be it

Resolved, A full measure of our thanks is due and is hereby extended to Mr. W. L. Frisbie, his very efficient corps of associates, and to the young gentlemen who have so agreeably and gentlemanly performed their duties as ushers.

Resolved, That the pastors and musicians of Rockford, who have so cheerfully and acceptably served the institute, are especially entitled to our gratitude.

Resolved, That to the press of Rockford, for its hearty co-operation in supporting the institute and the generous amount of space that it has given to the proceedings, our sincere thanks are due.

JAMES FRAKE,
J. N. COOLIDGE,
L. N. BEAL.

I move the adoption of the resolutions. Motion seconded.

President: It is moved and seconded that the resolution be adopted; all in favor make known by saying aye. Motion carried.

President: I most heartily thank your for your kindly coöperation in making this a successful meeting, and I trust the instruction to which we have listened may remain with us through the remainder of our lives. Many of us may have no part again in an assembly of this kind, but I am sure we will all have a pleasant memory of this meeting.

Mrs. Scott will lead you in singing "God be With You 'Till We Meet Again," and I trust all will unite in the song.

Institute adjourned.

CLASS WORK AT THE INSTITUTION.

The class exercises each morning in corn cultivation and judging, domestic science, live stock and horticulture were all well attended and proved to be a very important part of the institute's most practical work, and much enthusiasm was aroused over the instruction given and received. The daily attendance at the corn class was greater than the capacity of the hall, being from 300 to 400 each day. The other classes averaged 100 in daily attendance. So great was the desire for this class work that the classes met at 8 o'clock a. m., and then were not ready to adjourn for the general sessions. Each morning found persons waiting for the class work to begin, some of them having driven eight to ten miles in the early morning to be on hand, and could hardly wait till the leaders had had their breakfast.

MINUTES OF MEETINGS OF THE BOARD OF DIRECTORS AND EXECUTIVE COMMITTEE OF THE ILLINOIS FARMERS' INSTITUTE FROM FEB. 26, 1901, TO FEB. 25, 1902.

INSTITUTE ROOM STATE HOUSE, Feb. 26, 1901.

The board met as provided by the statutes, at 4:00 o'clock p. m. In the absence of the president it was called to order by Vice-President Beal. Roll call showed the following members present: Allen, Beal, Burroughs, Clark, Coolidge, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Mills, Moore, Newman, Shank and Steenberg.

Director Burroughs moved that the chairman appoint a committee on credentials of the new members.

Motion adopted.

The chairman named Directors Coolidge, Moore and King as such committee.

On motion a recess was taken till 7:30 p. m.

INSTITUTE ROOM, February 26, 7:30 p. m.

Board met as per adjournment. Roll call showed the following members present: Allen, Beal, Burroughs, Clark, Coolidge, Davenport, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Mills, Moore, Newman, Shank and Mrs. Steenberg.

The committee on credentials of new members made the following report:

To the Members of the Illinois Farmers' Institute.

GENTLEMEN—We, your committee on credentials, beg leave to report that we have examined the reports from the convention of delegates at the State meeting at Jacksonville and find that the following parties were duly elected to represent the even numbered congressional districts on the Board of Directors for the ensuing two years:

Second District—W. R. Goodwin, Chicago, Ill.
Fourth District—John M. Clark, Chicago.
Sixth District—William Stewart, Chicago.
Eight District—George A. Hunt, Greenwood.
Tenth District—J. H. Coolidge, Galesburg.
Twelfth District—F. I. Mann, Gilman.
Fourteenth District—Ralph Allen, Delavan.
Sixteenth District—A. P. Grout, Winchester.
Eighteenth District—E. W. Burroughs, Edwardsville.
Twentieth District—L. N. Beal, Mt. Vernon,
Twenty-second District—H. G. Easterly, Carbondale.

Respectfully submitted,

J. H. COOLIDGE,
AMOS F. MOORE,
S. NOBLE KING.

Director Frake moved that the report of the Committee on Credentials be approved.

Motion adopted.

Director Burroughs moved that the board proceed to the election of officers and that the first ballot be an informal one.

Motion adopted.

Director Kimzey moved that the chairman appoint three tellers.

Motion adopted and the chairman named Messrs. Hughes, Easterly and Burroughs as tellers.

The informal ballot for president resulted as follows: S. Noble King, 5 votes, A. P. Grout 2 votes, W. R. Kimzey 10 votes, J. H. Coolidge 1 vote, L. N. Beal 1 vote; total, 19. Necessary to a choice, 10 votes.

First formal ballot for president resulted as follows: King 3 votes, Grout 1 vote, Kimzey 13 votes, Beal 1 vote; total, 19.

W. R. Kimzey having received a majority of the votes cast was declared duly elected president for the ensuing year.

The informal vote for vice president resulted as follows: H. D. Hughes 2 votes, J. H. Coolidge 2 votes, G. W. Dean 1 vote, D. H. Shank 7 votes, S. Noble King 2 votes, L. N. Beal 3 votes, F. I. Mann 1 vote; total, 19. Necessary to a choice, 10 votes.

First ballot for vice president resulted as follows: Coolidge 5 votes, Dean 1 vote, Shank 6 votes, King 5 votes, Burroughs 1 vote, Beal 1 vote; total, 19. Necessary to a choice, 10.

Second ballot for vice president resulted as follows: Mrs. Steenberg 1 vote, Coolidge 4 votes, Shank 6 votes, King 8 votes; total, 19. Necessary to a choice, 10 votes.

Third ballot for vice president resulted as follows. Coolidge 3 votes, Shank 7 votes, King 8 votes, Beal 1 vote; total, 19 votes. Necessary to a choice, 10 votes.

Fourth ballot for vice president resulted as follows: James Frake 1 vote, Shank 5 votes, King 12 votes, Beal 1 vote; total, 19 votes.

S. Noble King having received a majority of the votes cast was duly declared elected vice president for the ensuing year.

The informal ballot for secretary resulted as follows: A. B. Hostetter 11 votes, Charles F. Mills 7 votes, blank 1 vote; total, 19 votes. Necessary to a choice, 10 votes.

First ballot for secretary resulted as follows: Hostetter 13 votes, Mills 5 votes, Wilson 1 vote; total, 19 votes.

A. B. Hostetter having received a majority of the votes cast was duly declared elected secretary for the ensuing year.

The informal vote for treasurer resulted as follows: A. P. Grout 15 votes, Shank 1 vote, Oliver Wilson 1 vote, H. G. Easterly 1 vote, D. W. Dean 1 vote; total, 19 votes. Necessary to a choice, 10 votes.

Director Mills moved that the secretary be instructed to cast the unanimous vote of the members present for A. P. Grout for treasurer. This was done and A. P. Grout declared duly elected treasurer for the ensuing year.

The informal ballot for superintendent of institutes resulted as follows: A. B. Hostetter 14 votes, D. H. Shank 1 vote, Oliver Wilson 2 votes, C. F. Mills 2 votes; total, 19 votes. Necessary to a choice, 10 votes.

The first ballot for superintendent resulted as follows: Hostetter 15 votes, Wilson 2 votes, Mills 1 vote, Dean 1 vote; total, 19 votes.

A. B. Hostetter having received a majority of the votes cast was declared duly elected secretary for the ensuing year.

The chairman appointed Director Coolidge a committee to conduct President-elect Kimzey to the chair. Director Coolidge performed this duty gracefully and introduced President Kimzey, who made a neat speech setting forth some of the things the institute had accomplished, spoke encouragingly of the future of the work, and thanked the board for the honor conferred upon him.

Director Easterly moved that the executive committee be authorized to approve the bond of Treasurer-elect A. P. Grout in the amount of $20,000, as heretofore.

Motion adopted.

Director Burroughs moved that $1,000 of the contingent fund be transferred to the general fund for expenses of the board, and asked for roll call on the adoption of the motion.

The roll was called with the following vote: Ayes—Allen, Beal, Burroughs, Clark, Coolidge, Davenport, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Mills, Moore, Newman, Shank, Mrs. Steenberg. Nays—None.

Motion adopted.

On motion the board adjourned till 11 o'clock a. m. Feb. 27, that the members may have opportunity to confer with the members of the General Assembly.

INSTITUTE ROOM, February 27, 11:00 a. m.

Board met as per adjournment at 11 a. m.

Roll call showed the following members present: Allen, Beal, Burroughs, Coolidge, Davenport, Dean, Grout, Hunt, Kimzey, Mills, Moore, Newman, Shank.

President Kimzey announced that all standing committees would hold over till new ones could be appointed.

The board took a recess to meet with the House Committee on Appropriations for the consideration of the Institute bill.

After returning to the institute room the board was again called to order and Director Dean moved that the president be instructed to call a meeting of the board at Champaign at the time of the dedication of the college of agriculture buildings.

Motion adopted.

The secretary read the following letter from Prof. W. L. Pillsbury, secretary of the board of trustees of the University of Illinois:

URBANA, ILL., Jan. 26, 1901.

Mr. A. B. Hostetter. Springfield, Ill.:

DEAR SIR—Our board of trustees at its meeting on the 23d inst. voted to invite the executive committee of the Illinois Farmers' Institute to nominate one of its members to serve for the year on the advisory board of our agricultural experiment station. Ever since the organization of the experiment station the State Board of Agriculture, State Horticultural Society, and State Dairymen's Association. have each appointed a member of this board. The advisory board meets once in three months and its suggestions with regard to the management of the station have been of great value.

Very truly yours,

W. L. PILLSBURY,
Secretary.

Director Moore moved that the invitation of the University of Illinois to nominate a member of the advisory board of the experiment station be accepted and the appointment be left with the executive committee.

Motion adopted.

Director Coolidge, chairman of Committee on Speakers for County Institutes, moved that the board recommend that the directors and county institute officers use the list of speakers named in Bulletin No. 2, at the coming district conferences.

Motion adopted.

After a general discussion of the agricultural bills pending in the legislature and the suggestion from the president that each director interview the members of the Assembly from his district in regard to their passage, the board adjourned.

Minutes read and approved May 21, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, April 4, 1901.

The executive committee met on call of the chairman. Members present—Beal, Kimzey and Shank. Minutes of meeting of February 27, 1901, were read and approved.

Director Beal moved that the secretary be instructed to write to Mr. Daniel Geohring of Metamora, Woodford county, that his claim for $2 could not be allowed and suggest that he present the same to the Woodford County Farmers' Institute, to be paid when they have funds, in regular form with their next report. Motion adopted.

Director Beal moved that the secretary be instructed to write to each director, stating that after an informal conference with the attorney general, that the executive committee recommends that each director continue to conduct the institute work in his present district as heretofore, regardless of any new apportionment by the present General Assembly, until the next annual meeting of the board. This to apply to district conferences, appointment of scholarships and all other institute work in charge of the director. Motion adopted.

Director Shank moved that the secretary be instructed to procure rubber stamps for the newly elected officers and members of the board. Motion adopted.

The following report was made on the bills presented to the committee for audit:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To whom drawn.	Amount.
1689	Central Union Telephone Co.	$ 35
1690	Frank Simmons, for library	34
1691	A. B. Hostetter, for postage for secretary's office	3 00
1692	Western Union Telegraph Co.	4 48
1693	John Underfanger, drayage	50
1694	The Pantagraph, for 750 copies of Pantagraph	22 50
1695	The Smith Premier Typewriter Co., rent of machine	1 50
1696	Adams Express Co.	9 61
1697	American Express Co.	12 02
1698	H. A. McKeenne, cleaning typewriter and janitor	5 00
1699	Coe Brothers, office supplies	2 50
1700	A. B. Hostetter, salary for February and March, 1901	250 00
1701	Amos F. Moore, expenses as director	36 92
1702	G. W. Dean, expenses as director	13 26
1703	W. R. Goodwin, expenses as director	14 95
1704	H. D. Hughes, expenses as director	24 58
1705	United States Express Co.	6 98
1706	L. N. Beal, expenses as director	18 00
1707	W. R. Kimzey, expenses as director	40 28
1708	D. H. Shank, expenses as director	12 61
	Total	$479 38

Approved April 4, 1901.

Signed, WALTER R. KIMZEY,
D. H. SHANK,
L. N. BEAL.

There being no further business the committee, on motion of Director Shank, adjourned.

Minutes read and approved, April 23, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, April 23, 1901.

The committee met as per call of the chairman. Present—Directors Kimzey, Beal, King and Shank.

Minutes of the meeting of April 4, 1901, were read and approved.

The treasurer, A. P. Grout, presented the following bond:

Know All Men by these Presents, that we, Albert P. Grout, as principal, and Percie C. Grout, Charles H. Condit and William Neat, as sureties, all of the county of Scott and State of Illinois, are held and firmly bound unto the Illinois Farmers' Institute, a public corporation of this State, in the penal sum of twenty thousand ($20,000) dollars, lawful money of the United States, to be paid to said Illinois Farmers' Institute, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors and administrators, severally and firmly by these presents. Signed with our hands and sealed with our seals this 12th day of April, A. D. 1901.

The condition of the foregoing obligation is such that, Whereas, the above bounden Albert P. Grout was, on the 26th day of February, A. D. 1901, duly elected treasurer of said Illinois Farmers' Institute, for the period of one year, expiring February 27, 1901, and required to give bond in the penal sum of twenty thousand ($20,000) dollars.

Now, therefore, the condition of this obligation is such that, if the said Albert P. Grout shall faithfully perform and discharge the duties of his office as treasurer of the said Illinois Farmers' Institute, and shall safely keep all money and other property entrusted to his care as treasurer, paying the same out when ordered by the Board of Directors of the Illinois Farmers' Institute and perform all duties required of him as such treasurer, by the Board of Directors of said Illinois Farmers' Institute, and at the expiration of his term of office as such treasurer, pay over to his successor in office, when appointed and qualified, or to such person or persons as the Board of Directors of said Illinois Farmers' Institute may direct or require, all moneys and other property then remaining in his hands as such treasurer, then this obligation to be void, otherwise to remain in full force and virtue.

[SEAL,] ALBERT P. GROUT,
PERCIE C. GROUT,
CHARLES H. CONDIT,
WILLIAM NEAT.

STATE OF ILLINOIS, }
SCOTT COUNTY. }

Before me, Alonzo Ellis, a notary public in and for said county, this day appeared Albert P. Grout, Percie C. Grout, Charles H. Condit and William Neat, to me personally known to be the same persons whose names are signed to the foregoing instrument in writing, and acknowledged that they executed the same for the uses and purposes therein stated.

Given under my hand and official seal this 12th day of April, A. D. 1901.

ALONZO ELLIS,
Notary Public.

Mr. S. Noble King moved that the bond of Albert P. Grout as treasurer be accepted, spread upon the records and placed on file. Motion adopted.

Director Beal moved that the secretary be instructed to request each director to make mention in his report of the leading agricultural industries of his district and furnish photographs illustrating the same for the annual report. Motion adopted.

Director King moved that the committee select by ballot a member of the board to represent the Illinois Farmers' Institute on the Advisory Board of the Experiment Station. Motion adopted.

A ballot being taken, Mr. S. Noble King was selected on the second ballot as such representative.

The following report was made on the bills presented for audit:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1709	Lake County Farmers' Institute, H. B. Pierce, treasurer	$75 00
1710	Peoria County Farmers' Institute, William West, treasurer	22 48
1711	Ralph Allen, expense at 14th district conference	2 85
1712	Geo. Shawver, expense at 14th district conference	2 70
1713	J. W. Griesemer, expense at 14th district conference	2 75
1714	C. J. Held, expense at 14th district conference	3 45
1715	Geo. H. Wiemer, expense at 14th district conference	2 87
1716	Springfield Trunk Co., library cases repairs	60
1717	Edw. F. Hartman Co., postage and printing	27 50
1718	A. B. Hostetter, postage secretary's office and repairs on typewriter	2 50
1719	Hez. Bramlet, delegate 22d district conference	5 48
1720	T. M. Mitchell, delegate 22d district conference	2 96
1721	Cyrille A. Marchildon, delegate 22d district conference	4 50
1722	L. J. Hess, delegate 22d district conference	3 58
1723	F. L. Sutherland, delegate 22d district conference	6 60
1724	C. J. Cross, delegate 22d district conference	3 75
1725	Geo. C. Schneeman, delegate 22d district conference	6 49
1726	J. H. Kinker, delegate 22d district conference	4 20
1727	S. Noble King, expenses as director	7 61
1728	D. H. Shank, expenses as director	13 45
1729	L. N. Beal, expenses as director	14 70
1730	W. R. Kimzey, expenses as director	18 41
	Total	$234 43

Approved April 24, 1901.

WALTER R. KIMZEY.
S. NOBLE KING,
L. N. BEAL,
D. H. SHANK,
Executive Committee.

On motion of Director Shank the committee adjourned.

Read and approved May 22, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

CHAMPAIGN, ILL., May 21, 1901.

The board of directors of the Illinois Farmers' Institute met as per adjournment in the parlors of the Bradley hotel, Champaign, Ill., at 8:00 o'clock p. m., May 21, 1901. The following directors answered to roll call. Allen, Beal, Burroughs, Clark, Dean, Easterly, Frake, Hughes, Hunt, Kimzey, King, Mann, Moore, Newman, Shank, Steenberg, Goodwin, Grout.

The minutes of the board meetings of Feb. 26 and 27, 1901 were read and approved. The minutes of the meetings of the executive committee of April 4 and 23, 1901 were read, and on motion of Director Frake the actions of the executive committee and the minutes were approved.

Director Mills offered the following resolution and moved its adoption:

WHEREAS, there is considerable interest manifested in the organization of farmers' clubs throughout the State, and

WHEREAS, said clubs cannot be confined to township lines in their membership or efforts to obtain the best results, and

WHEREAS, the standing committee of the State Institute on Township Institutes, can better promote the work contemplated through and by means of farmers' clubs, therefore be it

Resolved, that in article V of the constitution relating to township institutes, wherever the word township institute appears, the word farmers' club be substituted, so that article V shall read as follows: A committee on organizing farmers' clubs shall assist in promoting the interests of Farmers' club meetings throughout the State.

Resolution adopted.

Director Frake moved that Colonel Charles F. Mills be appointed a committee to draft resolutions of respect for our deceased member of the board, Honorable G. A. Willmarth of the Eleventh district. That an engrossed copy thereof be given to G. A. Willmarth in the forthcoming annual report.

Motion unanimously adopted.

Director Mills moved that it be declared the sense of this board that no member should serve more than one term as president of the board.

President Kimzey called Director Beal to the chair and spoke in favor of the motion. A vote being taken after considerable discussion the motion was lost.

The committee on legislation made the following report:

CHAMPAIGN, ILL., May 21, 1901.

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—We, your committee on legislation, beg leave to report that all the bills favored by the Illinois Farmers' Institute, namely, the bill making appropriation for the State institute and County Farmers' Institutes with an additional section providing $2,500 per annum for the free libraries, a bill increasing the number of copies of the annual report to 20,000, and the bill providing for the enlargement of the work of the experiment station and college of agriculture were passed and have been signed by the Governor.

The members of the Forty-second General Assembly are justly entitled to the thanks of the farmers of Illinois for their favorable consideration of the bills in the interest of the development of agriculture. We regard the coming together of the various agricultural associations and their harmonious coöperation in securing legislation for the common good as a most important step in the development of Illinois agriculture and one which promises much for the future. We desire that the following letter be spread upon the records as part of this report, showing, as it does, the section of the association bill for which the institute became responsible:

To the members of the Forty-second General Assembly:

Your attention is respectfully called to the following resolutions adopted by the Illinois Farmers' Institute committee on legislation:

WHEREAS, The Illinois Farmers' Institute is especially interested in the passage of the bill presented to the General Assembly by the various live stock, dairy, horticultural and other agricultural organizations of the State, and having for its object the enlargement of the scope of the work of the college of agriculture and agricultural experiment station, and,

WHEREAS, All the county farmers' institutes are especially interested in the provisions of section three of said bill, providing for the chemical and physical examination of the various soils of the State for the purpose of determining the character and location of the several classes of soils and ascertaining what crops and treatment are best suited to each, and whether the present methods are tending to the preservation or the reduction of their fertility, etc.; therefore be it

Resolved, by the Legislative Committee of the Illinois Farmers' Institute, that said bill is worthy of the cordial and hearty support of all interested in the further development of the agriculture of the State, and its passage by the General Assembly, should be urged by every county farmers' institute.

In asking your favorable consideration of the bill referred to and urging you to support the same, the Illinois Farmers' Institute does so advisedly and knows whereof it speaks, The question of maintaining the fertility of the soil has been considered, in some of its phases, at every one of the 100 farmers' institutes held in Illinois this present season, and the universal opinion has been that the soil is being robbed of its fertility, the resources of the State diminished and the labor and the investments of the farmers, in too many cases rendered unprofitable, because of the lack of scientific information in regard to the composition of the soils and their adaptability to produce certain products. The work of the experiment station and agricultural college which has been supported entirely by the funds from the United States appropriations and which has been limited on account of funds has been so thorough and practical and helpful to farmers, horticulturalists and live stock breeders of the State, that the State need not hesitate to appropriate funds to continue and enlarge the work.

The results of experiments in destroying smut in oats alone will return in one year many times the amount of the whole appropriation asked in this bill.

A thorough analysis of the soils of the State placed within the reach of the public, would invite investment in lands and stimulate the production of new crops, thereby increasing the resources of the State in its food production and relieving the drain upon the land and drag upon the markets by the overproduction of corn. In behalf of the Illinois Farmers' Institute. Yours respectfully signed, G. A. Willmarth, President and A. B. Hostetter, Secretary.

Respectfully submitted,

AMOS F. MOORE,
E. W. BURROUGHS,
G. W. DEAN,
W. R. KIMZEY,
HENRY M. DUNLAP,
Committee on Legislation.

The Secretary made the following report:

SPRINGFIELD, May 21, 1901.

To the Board of Directors of the Illinois Farmers' Institute.

ESTEEMED FRIENDS—During the fiscal institute year ending July 1, 1901, 100 counties have held institutes. The counties that have not held meetings are Cook and LaSalle, but it is the intention of LaSalle county to hold an institute in June. Eight counties have found it advantageous to hold two institutes during the year; they are, Adams, Champaign, Hancock, Lake, McHenry, Peoria, Shelby and Wabash, while Hamilton county has held three, making a total of 111 institutes for the year.

Ninety-nine counties have reported and their accounts paid. From these reports it appears that the State has paid from the appropriation of $75.00 to each county, the sum of $6,855.77 to the 99 counties, an average of $69.04 per county.

The State Institute paid from its funds $532.77 in aid of district institutes; this increases the cost to the State to $7,388.54, an average of $74.63 per county.

Fifty-two counties contributed a total of $2,245.16 of local and county funds to the support of the institutes, which makes the grand total cost of the 111 institutes $9,633.70, or an average of $97.41 per county.

These figures show that the counties paid on an average $22.68 for the support of the institutes. The amount paid by the counties the last year was $8.80; this indicates a very marked increase in the interest taken by the counties in the institute work.

Forty-six counties, however, failed to report any local funds paid for the support of their institutes, and 37 of these used less than the $75.00 appropriated by the State.

The reports of the institute meetings show clearly that the institutes which received the local money contributions were by far the best institutes. The experience of this year confirms the opinion expressed in my report a year ago, that the State funds are more judiciously expended when paid out in connection with local contributions, and that to relieve the community where the institute is held entirely from financial responsibility of its support, is to remove one of the strongest elements in the institute's success. The tendency of such a course is to place the institute in the attitude of an outside, State affair, instead of making it a home institution dependent largely upon home talent, energy, enthusiasm and money. I would respectfully recommend, therefore, that the board adopt a policy that will encourage the supplementing of the State appropriation with local funds.

The institute bulletins have proved of great help to the county institute officers. I therefore recommend the publication of another one on practically the same line as bulletin No. 2 at an early date.

The advantages of having advanced copies of the county institute programs seem to be of sufficient importance to warrant the continuance of the offer to print for the counties 1,000 copies of their institute programs, and I recommend that this be done.

A careful study of the programs of the several county institutes indicates that many of them are yet overloaded with topics and both outside and home speakers. The desire to advertise a big time and a good time to secure a great crowd too often overshadows what should be the leading purpose of every institute—profitable instruction on practical lines. I trust that the directors will keep this thought in mind when recommending speakers for county programs.

The inquiries in regard to scholarships in the college of agriculture are more numerous than heretofore, and the prospect is that some of the counties will have several applicants. I would suggest, therefore, that each director fix a date at which time all applications shall be in his hands and that no assignments be made to counties till after that date. I ask this to avoid the confusion we have had in the past of scholarships being assigned to other counties than the one in which the applicant lives.

Respectfully submitted,

A. B. HOSTETTER,

Superintendent.

Director Goodwin moved that the consideration of the superintendent's report be postponed till the morning session.

Motion adopted.

On motion the board adjourned until 9:30 a. m. May 22, 1901.

BEARDSLEY HOTEL, CHAMPAIGN, May 22, 1901.

The board of directors of the Illinois Farmers' Institute met as per adjournment. Present on roll call: Allen, Bayliss, Beal, Burroughs, Clark, Coolidge, Davenport, Dean, Dunlap, Easterly, Frake, Hughes, Hunt, Kimzey, King, Mann, Newman, Shank, Steenberg; total, 18.

The report of the superintendent being under consideration, Director Dean moved that the executive committee be authorized to have an institute bulletin published on the lines recommended.

Motion adopted.

Director Mann moved that 1,000 programs be printed for the use of the county institutes, as heretofore.

Motion adopted.

Director Allen moved that the executive committee be authorized to assign scholarships to the counties unoccupied after the opening of the school year in September.

Motion adopted.

The committee on domestic science made the following report:

We, your committee on domestic science, beg leave to report that in view of the increased growth of the domestic science associations and their valuable assistance to the farmers' institutes, we recommend that the sum of $500 be appropriated for the use of the Illinois Association of Domestic Science in publishing and distributing a domestic science booklet, the services of a typewriter, the expenses of speakers for a domestic science session at the State meeting and the expenses of the officers.

We further recommend that the amount of $125 be appropriated for the purchase of domestic science books for the use of the domestic science associations, to be loaned by the secretary of the Illinois Farmers' Institute.

Respectfully submitted,

MRS. SARA STEENBERG,
J. H. COOLIDGE,
J. M. CLARK,
W. R. KIMZEY,

Committee.

Director Dunlap moved that the report of the committee be accepted and that the question of purchasing domestic science books be referred to the library committee.

Motion adopted.

Director Burroughs moved that the $400 remaining in the contingent fund be transferred to the general fund for the expenses of the board.

The roll being called, the motion was adopted by a unanimous vote of all members present.

Director Burroughs moved that the sum of eight hundred (800) dollars be appropriated for the aid of congressional district institutes, $50 to be appropriated for each congressional district containing one or more counties; that the sum of five hundred (500) dollars be appropriated for the uses of the Illinois Association of Domestic Science; that two thousand (2,000) dollars be appropriated for the general expenses of the board of directors; that seventeen hundred (1,700) dollars be retained in the contingent fund; so that the appropriation made by the Forty-second General Assembly for the fiscal year beginning July 1, 1901, for the use of the Illinois Farmers' Institute shall be placed to the credit of the several funds as follows:

Fund No. 1—Office expenses, etc	$1,300 00
Fund No. 2—Salaries, etc	1,700 00
Fund No. 3—Libraries	2,500 00
Fund No. 4—General expenses of the board of directors, etc	2,000 00
Fund No 5—State fund county institutes	....
Fund No. 6—District institutes	800 00
Fund No. 7—Domestic science	500 00
Fund No. 8—Contingent fund	1,700 00
Total	$10,500 00

Roll call on Director Burroughs' motion resulted in the following vote: Ayes—Allen, Bayliss, Beal, Burroughs, Clark, Coolidge, Dean, Dunlap, Easterly, Frake, Hughes, Hunt, Kimzey, King, Mann, Newman, Shank, Mrs. Steenberg. Ayes, 18; nays, none.

Motion adopted.

The question of appointing the advisory committee provided for in the following section of an act passed by the Forty-second General Assembly, making appropriation for the enlargement of the work of the experiment station, was taken up:

> Section 3. That it shall be the duty of the agricultural experiment station to make chemical and physical examinations of the various soils of the State, and to determine the character and location of their several classes; to ascertain what crops and treatment are best suited to each; whether the present methods are tending to the preservation or reduction of their fertility, and what rotation and treatment will be most effective in increasing and retaining the productive capacity of Illinois lands, and that to carry out the provisions of this section there be, and is hereby, appropriated the sum of ten thousand dollars ($10,000) annually for the years 1901 and 1902: *Provided*, that the work in this section shall be carried out on lines to be agreed upon by the director of the agricultural experiment station and a committee of five to be appointed by the Illinois Farmers' Institute.

Mr. Mann moved that the term for which the committee be appointed be for two years, the life of the appropriation.

Motion adopted.

Director Allen moved that the board make nominations and that the executive committee appoint from this list of nominations the committee of five.

Motion adopted.

The following gentlemen were then put in nomination: W. E. Braden, Cutler; T. W. Thompson, Carbondale; A. N. Abbott, Union Grove; D. M. White, Loon Lake; H. T. Thompson, Marengo; W. R. Baldwin, Delavan; E. W. Burroughs, Edwardsville; William Slemmers, Paris; W. R. Kimzey, Tamaroa; Henry I. Bosworth, Elgin. The nominations were interrupted here by a suggestion from the secretary that there were serious objections to having this committee made up of people outside of the institute on account of their inability to meet with the institute board without personal expense, and that it was the intent at least of the General Assembly that this work should be part of the institute work. After a general discussion of this phase of the question Director Allen's motion was reconsidered and the motion laid on the table.

A motion was then made and carried that the board proceed to elect a committee by ballot and that those receiving the highest majority on the ballot be declared elected.

The chair appointed Directors Coolidge, Hughes and Easterly tellers, and the first ballot resulted in the election of W. R. Kimzey and E. W. Burroughs, members of the committee. On the third ballot H. G. Easterly and H. D. Hughes were duly elected members of the committee, and on the fourth ballot Ralph Allen was elected as the remaining member of the committee.

The officers of the Illinois Domestic Science association called upon the board to express their thanks for the increased appropriation made for the uses of their organization. Mrs. Carter stated that there were now domestic science organizations in 68 counties of the State, and that with the increased means at their disposal that this number would be increased during the coming year. She thanked the Board of Directors for their financial and other support given to their association. Mrs. S. Noble King, secretary, stated that they would soon have a booklet ready for distribution giving a report of their branch of the institute work and instructions for organizing domestic science associations and suggestive programs for local meetings, list of books, etc.

President Kimzey replied that the board regarded the Domestic Science association as an essential part of the institute, and that it would continue to have the hearty support of the directors.

The president asked for nominations to fill the vacancy of director in the Eleventh Congressional district.

Director Coolidge placed Arthur W. Bryant of Princeton, Bureau county, in nomination. There being no other nominations made, Director Frake moved that the secretary cast the unanimous ballot of the members present for A. W. Bryant for director for the Eleventh district.

Motion adopted.

The secretary announced that he had prepared the ballot as instructed and cast 17 votes for Arthur W. Bryant, whereupon the president declared Mr. Arthur W. Bryant duly elected director for the Eleventh district for the unexpired term.

On motion of H. G. Easterly the board adjourned.

Minutes read and approved June 25, 1901.

WALTER KIMZEY,
President,

A. B. HOSTETTER,
Secretary.

BEARDSLEY HOTEL CHAMPAIGN, ILL., May 12. 1901.

The executive committee met on call of the chairman. Present, Directors Kimzey, King, Beal, Frake and Shank.

The secretary presented the bid of Phillips Bros. for printing and cuts for annual report as follows: For full page cuts $5 per cut; small size $2.10; for inserting small cuts in report 50 cents each.

Director Frake moved that the secretary be instructed to accept the bid of Phillips Bros. for this work.

Motion adopted.

The following report was made on the bills presented for audit:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1731	Adams Express Co., for expressage	$ 89
1732	American Express Co., for expressage	3 59
1733	United States Express Co., for expressage	11 75
1734	Western Union Telegraph Co	1 86
1735	C. J. Davis, delegate to 15th district conference	4 80
1736	A. R. Stickle, delegate to 15th district conference	2 31
1737	S. N. Black, delegate to 15th district conference	3 62
1738	W. B. Marvel, delegate to 15th district conference	2 82
1739	C. M. Doyle, delegate to 15th district conference	2 33
1740	I. M. Capps, delegate to 15th district conference	1 50
1741	G. W. Dean, expenses as director, conference	4 20
1742	Mrs. Joseph Carter, for Illinois Association Domestic Science	6 16
1743	Isaac S. Raymond, delegate to 13th district conference	1 67
1744	John Iehl, delegate to 13th district conference	3 63
1745	Joseph Coombe, delegate to 13th district conference	2 30
1746	S. Noble King, expenses as director, conference	4 20
1747	S L. Rishel, delegate to 10th district conference	2 68
1748	C. E. Peck, delegate to 10th district conference	7 74
1749	Joseph Ingham, delegate to 8th distrtrict conference	1 00
1750	W. R. Sandham, delegate to 10th district conference	4 40
1751	A. E. Myers, delegate to 8th district donference	1 50
1752	George A. Hunt, evpenses as director 8th district conference	5 53
1753	J. H. Turner, delegate to 8th district conference	3 13
1754	C. D. Bartlett, delegate to 8th district conference	3 25
1755	Willis A. Clark, delegate to 8th district conference	3 29
1756	Rufus Cruthis, delegate to 18th district conference	1 24
1757	W. E. Killam, delegate to 18th district conference	3 60

Warrant No.	To Whom Payable.	Amount.
1758	I. M. Woodruff, delegate to 18th district conference	$ 6 89
1759	John S. Clup, delegate to 18th district conference,	2 30
1760	A. R. Hostetter, salary for April 1901	125 00
1761	W. R. Goodwin, for expenses as director	9 50
1762	A. V. Schermerhorn, delegate to 21st district conference	4 50
1763	J. D. Maxwell, delegate to 21st district conference	98
1764	W. J. Harms, delegate to 21st district conference	5 04
1765	A. O. Metzler, delegate to 21st district conference	2 69
1766	W. R. Kimzey, expenses as director	21 75
1767	D. H. Shank, expenses as director	10 60
1768	James Frake, expenses as director	3 95
1769	A. B. Hostetter, expenses attending board meeting	10 36
1770	Mrs. S. Noble King, for Illinois Association Domestic Science	13 10
1771	John M. Clark, expenses as director	10 91
1772	F. I. Mann, expenses as director	6 82
1773	L. N. Beal, expenses as director	15 00
1774	Alfred Bayliss, expenses as director	7 53
1775	H. M. Dunlap, expenses as director	2 00
1776	G. W. Dean, expenses as director	11 56
1777	George A. Hunt, expenses as director	15 09
1778	Joseph Newman, expenses as director	10 00
1779	Mrs. Sara Steenberg, expenses as director	12 91
1780	H. D. Hughes, expenses as director	15 00
1781	S. Noble King, expenses as director	3 73
1782	J. H. Coolidge, expenses as director	16 20
1783	A. B. Hostetter, postage, secretary's office	1 75
1784	E. W. Burroughs, expenses as director	31 48
	Total allowed	$471 63

Approved May 22, 1901.

WALTER R. KIMZEY,
L. N. BEAL,
D. H. SHANK,
S. NOBLE KING,
JAMES FRAKE.

There being no further business, on motion the committee adjourned.

Minutes read and approved June 25, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, STATE HOUSE, June 25, 1901.

The Board of Directors met at 1:30 p. m. as per adjournment.

Roll call showed the following members present: Allen, Beal, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, Mann, Mills, Moore, Newman, Bryant, Shank. Total, 15.

The minutes of the board meetings of May 21 and 22, 1901, and of the Executive Committee meeting of May 22 were read and approved.

The president called for reports of standing committees.

The Committee on Speakers made the following report:

SPRINGFIELD, ILL., June 24, 1901.

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—We, your committee to select speakers, beg leave to report that the task of securing a list of competent speakers becomes more difficult from year to year, for not only the good of the institutes must be considered but the wishes of the speakers as well.

A letter was sent by the secretary to all speakers who were on the list last year thanking them for the efficient service rendered the institutes the past year and asking their consent to place their names on the list again this year with any new or additional topics which they might wish to add. A similar letter was also sent to the new speakers recommended by the several directors. From these replies the committee has secured speakers who are to attend institutes on payment of their expenses, and who will attend county institutes for compensation besides their expenses. Some who have proved very able and efficient institute instructors have declined to have their names again used on the list of speakers. Others have neglected to reply in any way to the letters. The lists of those who have consented to act as institute speakers represents nearly every section and important agricultural interest of the State. Your committee, therefore, recommends that all who have replied favorably to the requests of the letter of the committee be placed on the list of speakers for the ensuing year. We further recommend that the dean of the college of agriculture be requested to furnish a list of the university faculty who may be called upon for institute work.

We further recommend that a list of all students who have had scholarships in the college of agriculture be published as part of the list of speakers and that county institute officers be urged to place the students on their home county institute program.

Respectfully submitted,

J. H. COOLIDGE,
JOSEPH NEWMAN,
WALTER R. KIMZEY,
Committee.

Director Easterly moved that the report of the committee be approved and the list of speakers as recommended be adopted for the ensuing year.

Motion adopted.

To the President and Board of Directors of the Illinois Farmers' Institute:

Your committee on special features for improving county institutes begs leave to report as follows:

We are unable to report any special features that would be applicable to all county institutes. We find in use in different counties certain features that might prove of benefit if more generally used. We can suggest a few of these features with the suggestion that they may be given a trial where conditions seem favorable.

Features of publicity—In addition to the usual newspaper notices and distribution of programs, personal invitation mailed to leading farmers in different sections of the county has in some counties materially increased the attendance at institutes. The appointment of vice presidents or honorary members in various townships will sometimes create more interest. An annual picnic under the auspices of the institute, held either in a convenient location or in the nature of an excursion to some point of agricultural interest, is an interesting feature in some counties. A number of modifications in the plan of giving prizes are in vogue. Prizes for small area of some crops are offered where grown by a boy under a certain age. Prizes are also offered to farm boys and girls for best essay on some practical farm subject, and one session of the institute is devoted to the reading of the essays. Prizes on general crops as well as live stock and poultry are still interesting features in many counties, but are not increasing in popularity, only where the end aimed at is one of educational advantage. Schools of instruction might be commended in many counties and could cover such topics as instruction and judging in corn and other grains, as well as on live stock of various kinds and breeds. Kitchen schools are proving of interest in several counties. Dairy schools would be of great advantage in many localities. Contests in different forms of farm work, such as plowing matches where prizes are given for the best work done of its kind, have proved interesting in some places. Papers on the resources of the county might be valuable additions to the program and have a tendency to create more interest and pride in home affairs.

Respectfully submitted,

F. I. MANN,
Chairman of Committee.

On motion of Director Shank the report was approved.

Director Mills made verbal report for the committee on the organization of farmers' clubs and stated that the committee was making progress and would report plans for the conducting of farmers' clubs at a later meeting of the board.

The committee on Agricultural Education and Library reported as follows:

JUNE 24, 1901.

To the Board of Directors Illinois Farmers' Institute:

GENTLEMEN—Your committee on Agricultural Education and Library beg leave to submit the following report and recommendations:

As a result of the appropriations heretofore made by your board, there have been equipped a total of 41 libraries, containing an aggregate of 2,192 volumes, at a cost, including cases of $1,035.11. The books are in sets as follows:

One set contains six (6) libraries.

Three sets contain five (5) libraries.

Two sets contain ten (10) libraries.

Libraries have been sent to 72 places and there are now on hand 27 applications to be filled.

The committee believe that the work of selection and distribution by the secretary of the board, has been done with remarkable economy and good judgment.

1. We recommend that the request of the Illinois Association Domestic Science for specially selected books adapted to its work, amounting to $125 be granted, and that the same be purchased by the secretary as soon as the proper committee of that organization shall supply him with the titles of the books desired. *Provided*, that the books so purchased shall be distributed by the officers of the Domestic Science association.

2. That this committee be authorized and instructed to select at least five libraries to be known as "The Study Circle Set," adapted to the use of local clubs of adults holding regular meetings for discussion of farm topics.

3. That the balance of the appropriation available for 1901. To be expended upon substantially the same lines of heretofore followed, no set of books to be used in fewer than five or more than ten libraries.

4. That the bulletins of the United States Department of Agriculture be bound in groups for use in the libraries.

5. That a list of the books in the several library sets be published in the institute bulletin.

6. That the secretary be instructed to secure a card, or other system of keeping the records of the libraries and their use.

7. That the secretary be authorized to attend the coming meeting of the A. L. A. at Waukesha, July 3-10, 1901, for the purpose of obtaining as much information as possible relating to the management of free circulating libraries, etc.

8. That in the management of the circulating libraries, the secretary be advised to secure the active coöperation of the county superintendents of schools wherever practicable.

All of which is respectfully submitted.

ALFRED BAYLISS, *Chairman.*
WALTER R. KIMZEY,
RALPH ALLEN,
F. I. MANN,
Committee.

Director Easterly moved that the report and recommendations of the committee be adopted.

Motion carried.

Director Mann moved that the books on domestic science which are in the care of the secretary for the use of domestic science associations be turned over to the officers of the Illinois Association Domestic Science, provided that that association is willing to assume the responsibility of their circulation and care.

Motion adopted.

Director Mills' committee to draft resolutions in memory of Director G. A. Willmarth, deceased, reported as follows.

WHEREAS, The Illinois Farmers' Institute has been deprived of the genial companionship, able counsel, and earnest and aggressive coöperation in the work of this organization by the death of the late Honorable G. A. Willmarth; and,

WHEREAS, The deceased during his several terms of office as a member of this board, and during his succeeding terms as President of the Illinois Farmers' Institute, has rendered valuable service in encouraging the adoption of the best methods of improved agriculture throughout the State; and,

WHEREAS, Mr. Willmarth labored ably, earnestly and constantly for the cause of agricultural education, and did much in his line to create additional interest in the study of all that pertains to better conditions on the farm, both in the institute meetings and the college of agriculture; therefore, be it

Resolved, That the Illinois Farmers' Institute esteems it a great privilege and pleasure to bear testimony to the spirit of patriotism and devotion to duty that characterized the efforts of our esteemed co-laborer and friend in the discharge of the labors incident to the several honorable positions he has occupied.

Resolved, That in the death of Mr. Willmarth, the agriculture of the State has been deprived of the services of an earnest advocate of advancement in all lines of improvement in matters pertaining to rural pursuits.

Resolved, That the members of this board extend to the family and friends of the deceased a full measure of sympathy in the death of an esteemed co-laborer.

Resolved, that a memorial page in the forthcoming volume be set apart for Mr. Willmarth, and that an engrossed copy of these resolutions be sent to the family of the deceased.

Director Shank moved the adoption of the resolutions. Resolutions unanimously adopted by a rising vote.

Director Mills offered the following resolution:

WHEREAS, the late annual meeting of the Illinois Farmers' Institute was held in the central division of the State; and,

WHEREAS, the preceding State meeting of this organization was held in the southern division; therefore, be it

Resolved, that the institute work of the State will be best subserved by holding the next annual meeting in the northern division.

Resolved, that the application of the farmers and other citizens of Winnebago county for the location of the next annual meeting at Rockford, be and is hereby favorably considered.

Resolved, that the committee on State institute meeting be authorized to accept the application for the location of the next meeting at Rockford, upon the filing with the committee of a contract signed by the representatives of said city satisfactory to the committee. If our committee can not make a satisfactory contract with the people of Rockford, then the location be left with the committee, it being understood that the hall rent, wherever located, be paid by the Illinois Farmers' Institute if necessary.

The roll being called, the resolution was adopted by the following vote: Ayes—Allen, Beal, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, Mann Mills, Moore, Newman, Bryant.

Nays—Shank. Not voting—Dean. Ayes, 13; nays, 1; not voting, 1.

Director Easterly moved that the by-laws of the institute be amended to read May instead of June for the closing meeting of the fiscal year, and asked that consideration of the same be postponed till the next meeting of the board.

On motion the board took a recess till 7:30 p. m.

INSTITUTE ROOM, June 25, 1901, 7:30 P. M.

The board met as per adjournment, the same members being present as at the afternoon meeting.

Director Mills moved that any money unused in the several funds after the first of July be apportioned by the executive committee to such fund as the committee deem best.

The roll being called on the adoption of the motion, resulted as follows: Ayes—Allen, Beal, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, Mann, Mills, Moore, Newman, Shank, Bryant. Ayes, 15; nays, none. Motion adopted.

Director Mills offered the following resolutions and moved their adoption:

WHEREAS, the General Assembly has made it the duty of the Agricultural Experiment Station to make chemical and physical examination of the various soils of the State and to determine the character and location of their several classes, to ascertain what crops and treatment are best suited to each, whether the present methods are tending to the preservation or the reduction of their fertility and what rotation and treatment will be the most effective in increasing and retaining the productive capacity of Illinois land, and, WHEREAS, the statute provides that to carry out the provisions of said law an appropriation of $10,000 has been made for the years 1901 and 1902, and,

WHEREAS, it is provided in said law that the work outlined above shall be carried out on lines to be agreed upon by the director of the Agricultural Experiment Station and a committee of five to be appointed by the Illinois Farmers' Institute; therefore, be it

Resolved, that the committee appointed by this board to carry out the provisions of the above act be and are hereby directed to prepare and present to the director of the Agricultural Experiment Station an outline of a plan of investigation that will tend to give prompt and practical benefits to the greatest number of growers of the leading crops produced in the State.

Resolved, that all the recommendations of the committee appointed by the Illinois Farmers' Institute to carry out the provisions of the act referred to above, be reported in writing to the board at any future meeting. Motion adopted.

Director Allen moved the executive committee be instructed to prepare a new roster card and that the new committees be added thereto. Motion adopted.

Director Kimzey, chairman of the committee to advise with the Experiment Station, as provided in bill 315, made verbal report of the work of the committee and asked for further time in which to make written report. Which request was granted.

Director Mills moved that the Illinois Farmers' Institute endorse the idea of a post graduate course in agriculture, under the direction of the Department of Agriculture at Washington, and of a free scholarship therein as outlined in the resolutions adopted by the several agricultural associations at their meeting in Champaign. Motion adopted.

On motion the board adjourned.

Minutes read and approved, Oct. 3, 1901.

WALTER R. KIMZEY, *President.*

A. B. HOSTETTER, *Secretary.*

INSTITUTE ROOM, STATE HOUSE, June 24, 1901.

The executive committee met on call of President Kimzey at 11 a. m., June 24, 1901. Present—Directors Kimzey, Beal, Shank and Frake.

Secretary Hostetter presented a statement from the treasurer of Lake county that they had not received pay for their county institute expenses and stated that warrant No. 1709 had been drawn and mailed to Treasurer H. B. Pierce.

Director Frake moved that on presentation of evidence that the warrant had been lost that the president and secretary be authorized to issue a duplicate of warrant No. 1709.

Motion adopted.

Director Beal moved that the secretary be instructed to have printed 2,000 bulletins, in accordance with the recommendations of the several committees; also roster cards for the directors.

Motion adopted.

After examining and allowing the following bills the committee adjourned:

To the Board of Directors of the Illinois Farmers' Institute:

We, the members of the executive committee, have duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1785	Adams Express, Farmers' Institute, E. S. Frank, treasurer	$ 29 10
1786	Gallatin County Farmers' Institute, W. A. Peeples	72 50
1787	Pacific Express Co	1 97
1788	American Express Co	1 24
1789	Adams Express Co	1 57
1790	Edw. Hartmann Co., printing	33 75
1791	John L. McGuire, delegate 11th district conference	3 51
1792	W. S. Perry, delegate 11th district conference	1 22
1793	Frank J. Nye, delegate 11th district conference	5 37
1794	Arthur W. Bryant, expenses as director	6 59
1795	Chas. F. Mills, expenses as director	14 11
1796	H. G. Easterly, expenses as director	16 00
1797	A. B. Hostetter, expenses attending board meeting	1 50
1798	Illinois Association Domestic Science	2 70
1799	G. T. Beck, expenses as delegate 20th district conference	4 25
1800	Mrs. C. H. Kornmeyer, expenses as delegate 20th district conference	2 77
1801	M. E. Shurtleff, expenses as delegate 20th district conference	4 50
1802	Isaac W. Jacques, expenses as delegate 20th district conference,	5 00
1803	J. W. Wiess, expenses as delegate 20th district conference	5 04
1804	L. N. Beal, expenses as delegate 20th district conference	1 75
1805	A. B. Hostetter, postage secretary's office	5 00
1806	J. D. Trimble, expenses as delegate 19th district conference	3 20
1807	F. D. Voris, expenses as delegate 19th district conference	4 75
1808	Peter Beever, expenses as delegate 19th district conference	3 72
1809	Frank Britton, expenses as delegate 19th district conference	6 40
1810	Richland county and 19th district institute, F. Britton, treasurer	15 00
1811	Ralph Allen, expenses as director	11 60
1812	A. B. Hostetter, salary for May, 1901	125 00
1813	Western Union Telegraph Co	1 46
1814	Illinois Association Domestic Science, Mrs. S. Noble King	139 18
1815	D. H. Shank, expenses as director	20 10
1816	L. N. Beal, expenses as director	22 49
1817	A. W. Bryant, expenses as director	7 27
1818	A. W. Bryant, expenses as director	15 42
1819	Amos F. Moore, expenses as director	36 90
1820	F. I. Mann, expenses as director	8 72
1821	H. G. Easterly, expenses as director	14 50
1822	G. W. Dean, expenses as director	11 26
1823	Geo. A. Hunt, expenses as director	19 78
1824	Joseph Newman, expenses as director	20 70
1825	H. D. Hughes, expenses as director	19 48
1826	LaSalle County Farmers' Institute, F. M. Higgins, treasurer	62 24
1827	Phillips Bros., printing	3 20
1828	A. P. Grout, expenses as director	23 30
1829	James Frake, expenses as director	6 20
1830	Walter R. Kimzey, expenses as director	15 14
1831	Ralph Allen, expenses as director	5 20
	Total	$451 08

Approved June 25, 1901.

WALTER R. KIMZEY,
D. H. SHANK,
L. N. BEAL,
JAMES FRAKE.

Minutes read and approved Aug. 29, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

SPRINGFIELD, Aug. 29, 1901, 1:30 p. m.

The executive committee of the Illinois Farmers' Institute met in the Institute room, State House, on call of Chairman Walter R. Kimzey.

Present—Directors Kimzey, Frake, Beal, King and Shank.

The minutes of the meeting of the committee of June 24 and 25 were read and approved.

Director King offered the following preamble and resolutions and moved their adoption:

WHEREAS, The Louisiana Purchase Exposition, to be held in St. Louis during the year 1903, will afford a most favorable opportunity for Illinois to show her agricultural products and resources to the nations of the world; and,

WHEREAS, The early and hearty coöperation of all the associations of Illinois interested in the development of our agricultural and livestock interests would secure a more comprehensive and instructive exhibit than could possibly be made without such coöperation; therefore,

Resolved, That the executive committee of the Illinois Farmers' Institute invite the following associations of Illinois to meet in conference on Thursday, the 3d of October, 1901, in the Assembly hall, Dome building, on the State fair gronnds, at 10:00 o'clock a. m., for the purpose of discussing and devising ways and means of making the best possible showing of the resources and products of Illinois at the Louisiana Purchase Exposition in St. Louis in 1903: Illinois State Board of Agriculture, State Horticultural Society, Illinois Live Stock Breeders' Association, Illinois Dairymen's Association, Illinois Corn Breeders' Association, Illinois Corn Growers' Association, Illinois Agricultural Press Association, Illinois Bee Keepers' Association, Illinois Tile Makers' Association, College of Agriculture, Illinois Poultry, Pigeon and Pet Stock Association, Sugar Beet Growers' Association.

Motion adopted.

Director King moved that the president and secretary be authorized to assign scholarships to the unoccupied counties after the 14th of September.

Motion adopted.

Director Beal moved that the secretary be instructed to secure headquarters for the Illinois Farmers' Institute on the State fair grounds during the State fair.

Motion adopted.

The committee then took up the bills submitted by the secretary and made the following report:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1832	McDonough County Farmers' Institute, S. A. Merriam, treasurer	$ 18 25
1833	American Express Co	1 04
1834	Pacific Express Co	88
1835	Western Union Telegraph Co	2 45
1836	John Underfanger, drayage	5 19
1837	A. B. Hostetter, for Josiah Taborn, cleaning carpet	5 00
1838	A. B. Hostetter, for postage, secretary's office	18 75
1839	Springfield Trunk Co., for 10 library cases	27 50
1840	Library Bureau, for library supplies	19 23
1841	L. C. Ferrell, 40 volumes Department of Agriculture books	26 00
1842	A. C. McClurg, 320 volumes for libraries	251 10
1833	A. B. Hostetter, expenses A. L A. meeting	36 55
1844	Mrs. S. Noble King, for Illinois Association Domestic Science	37 73
1845	A. B. Hostetter, salary for June and July, 1901	250 00
1846	H. A. McKeene, for janitor service	5 00
1847	W. C. Schuppel, for engrossing resolutions	5 00
1848	Charles F. Mills, for expenses as director	23 25
1849	H. G. Easterly, for expenses as director	30 30
1850	A. W. Bryant, for expenses as director	17 28
1851	A. P. Grout, for expenses of district conference delegates	27 42
1852	Edw. F. Hartmann Co., printing	98 75
1853	Phillips Bros., 36 half tone cuts	89 30
1854	A. B. Hostetter, for expenses committee meeting at Rockford	7 05
1855	Frank Simmons, for books and binding	372 81
1856	Felix J. Streychmans, report of State institute	66 00
	Total	$1,441 83

Approved August 29, 1901.

WALTER R. KIMZEY,
L. N. BEAL,
D. H. SHANK,
S. NOBLE KING,
JAMES FRAKE.

Adjourned to meet Friday, August 30, at 8 o'clock a. m.

INSTITUTE ROOM, August 30, 8 o'clock a. m.

Director Frake moved that to close up the business of the year that $70.73 be transferred from fund No. 2 to fund No. 1, $48.27 from fund No. 2 to fund No. 4, $11.47 from fund No. 3 to fund No. 4, $252.23 from fund No. 6 to fund No. 4.

The roll being called on the adoption of the motion, the same was carried by the following vote: Ayes—Beal, Frake, Shank, King, Kimzey. Nays, none.

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1857	J. H. Coolidge, expenses as director	$36 07
1858	H. G. Easterly, expenses as director	16 25
1859	W. R. Kimzey, expenses as director	97 62
1860	A. B. Hostetter, expenses committee meeting at Winchester	5 94
1861	Springfield Trunk Co., traveling case	5 00
1862	D. H. Shank, expenses as director	8 20
1863	S. Noble King, expenses as director	14 35
1863	L. N. Beal, expenses as director	15 94
1865	James Frake, expenses as director	6 95
	Total	$206 32

Approved August 30, 1901.

WALTER R. KIMZEY,
S. NOBLE KING,
JAMES FRAKE,
L. N. BEAL,
D. H. SHANK.

On motion the committee adjourned.

Minutes read and approved October 3, 1901.

A. B. HOSTETTER,
Secretary.

WALTER R. KIMZEY,
President.

MINUTES OF THE BOARD OF DIRECTORS.

October 3, 1901.

The board of directors met as per adjournment in the institute headquarters, State Fair grounds, at 9 o'clock a. m., Oct. 3, 1901.

Roll call showed the following members present: Allen, Bryant, Burroughs, Coolidge, Davenport, Dean, Frake, Goodwin, Hunt, Grout, Hughes, Kimzey, King, Mann, Mills, Moore, Newman, Shank, Steenberg, Stewart.

The minutes of the board meeting of June 25, 1901, were read and approved.

The minutes of the executive committee of June 24th and 26th and August 29th and 30th were read, and on motion of Director Burroughs, the minutes of meetings and the acts of the executive committee were approved.

The time having arrived for the meeting of the several agricultural associations in the interest of an exhibit of Illinois at the Louisiana Purchase Exposition, the board adjourned to meet at 8 o'clock p. m. in the institute office in the State house.

INSTITUTE ROOM, Oct. 3, 1901—8 o'clock p. m.

The board met as per adjournment. Roll call showed the following directors present: Allen, Bryant, Burroughs, Dean, Easterly, Frake, Goodwin, Hunt, Hughes, Kimzey, King, Mann, Moore, Newman, Steenberg, Stewart.

Director Kimzey, chairman of the State meeting program committee, reported that satisfactory arrangements had been made with the Winnebago County Farmers' institute and the citizens of Rockford, Ill., to hold the annual meeting in the city of Rockford, February 18th to 21st, inclusive, 1902; that the State Horticultural society had been invited to coöperate in having a horticultural session, with the best talent on that line that can be secured; the Illinois Live Stock Breeders association to coöperate in a live stock session; the State Dairymen's association to coöperate in a dairy session; the corn growers and corn breeders in farm crops session, and that the Illinois Association of Domestic science would also conduct a session as heretofore; that classes would be conducted daily in live stock, horticulture, corn culture and domestic science. A special feature in which every farmers institute and citizen of Illinois will be interested will be a session devoted to the work to be accomplished by the experiment station, as provided for by a liberal appropriation in House Bill 315.

Director Frake moved the report of the committee and the program be approved. Motion adopted.

Director Burroughs, chairman of the auditing committee reported as follows:

SPRINGFIELD, ILL., August 26, 1901.

To the President and Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—We, your auditing committee, take leave to report that we have made a careful examination of the books of Secretary A. B. Hostetter and Treasurer A. P, Grout and desire to make the following report:

The treasurer's record shows that since the date of our last report, February 26, 1901, the $1,400.00 then in the contingent fund has, by order of the board, been transferred to the general expense fund, and thus the books show as follows:

No.	Fund.	Balance Feb. 26, 1901.	Paid out.	Balance old appropriation Aug. 26, 1901.	New appropriation.	Final balance Aug. 26, 1901.
Fund 1..	Office expense, etc	$ 455 88	$ 389 55	$ 66 33	$1,300 00	$1,366 33
Fund 2..	Salaries, etc	940 00	630 00	310 00	1,700 00	2,010 00
Fund 3..	Library	12 41	94	11 47	2,500 00	2,511 47
Fund 4..	General expenses	2,134 47	2,056 04	78 43	2,000 00	2,078 43
Fund 6..	District institutes	443 42	191 19	252 23	800 00	1,052 23
Fund 7..	Domestic science	253 54	253 54	....	500 00	500 00
Fund ...	Contingent fund	....	....	....	1,700 00	1,700 00
		$4,239 72	$3,521 26	$718 46	$10,500 00	$11,218 46
	Four unpaid old warrants, unassigned to any fund	....	....	....	....	3 69
	Making the total funds in hands of treasurer	....	....	....	....	$11,222 15

The secretary's books show orders drawn and unpaid chargeable to the following accounts:

Warrant number.	Fund number.	From what drawn.	Amount.
1712	4	General expenses, etc	$2 70
1749	4	General expenses, etc	1 00
1759	4	General expenses, etc	2 30
1765	4	General expenses, etc	2 69
1820	4	General expenses, etc	8 72
		Total	$17 41

And that the following balances remain to the credit of the respective funds:

Fund No.	Fund.	Amount.
1	Office expenses, etc	$1,363 33
2	Salaries, etc	2,010 00
3	Library	2,511 47
4	General expenses	2,061 02
5	District institutes	1,052 23
6	Domestic science	500 00
7	Contingent fund	1,700 00
	Total	$11,201 05

We further recommend that the old warrants outstanding, Nos. 1297, 1153, 1357 and 1385, amounting to $3.69, be here cancelled and that amount be placed to the credit of the general expense fund No. 4.

We are glad to say that notwithstanding the vast number of warrants that have been issued, we have found the treasurer's and secretary's accounts to correspond exactly without the variation of a single figure, and that both treasurer and secretary are deserving of commendation for the manner in which the records in their respective offices have been kept.

Respectfully submitted,

E. W. BURROUGHS,
GEO. A. HUNT,
H. D. HUGHES,
H. G. EASTERLY,
WALTER R. KIMZEY,
Auditing Committee.

Director Allen moved that the report of the auditing committee be adopted.

Motion carried.

Director Frake moved that the amount of $3.69, being the amount of the old outstanding warrants cancelled by the report of the auditing committee, be placed to the credit of the general expense fund No. 4.

The roll being called the motion was adopted by a unanimous vote.

Director Mills, chairman of the Committee on Organization of Farmers' Clubs, made verbal report of the work and plans of the committee and was allowed further time in which to make written report.

Director Kimzey, chairman of the Committee on Soil Investigations and Experiments, reported as follows:

To the Board of Directors, Illinois Farmers' Institute.

GENTLEMEN—We, your committee to coöperate with the college of agriculture and the experiment station in carrying out the provisions of house bill 315, providing for soil investigations and experimentation, beg leave to report progress as follows:

The conference called to consider plans for soil investigation, met at the agricultural college, Urbana, Ill., June 18, 1901, at 8:15 a. m. There were present from the committee appointed by the State Farmers' Institute, Messrs. E. W. Burroughs, Ralph Allen, H. D. Hughes and Walter R. Kimzey; and from the experiment station, Director E. Davenport and Messrs. Hopkins, Ward and Smith. Director Davenport called the meeting to order and discussed briefly the general purpose of the conference. Professor Hopkins was elected as temporary chairman to act when the Director was not present, and Mr. Kimzey was elected as secretary.

After consultation and discussion the following lines of soil investigation were agreed upon:

1. In order to determine the immediate needs of the soil it was agreed that plot experiments should be conducted in about 15 or 20 localities in different sections of the State on different classes of soils which are typical of large areas of land. These plot experiments should include applications of the different elements of plant food and different methods of soil treatment in order to discover whether the soil is deficient in the available supply of any essential elements of fertility, whether its physical condition may be improved, and its productive capacity increased.

2. Analyses should be made of the various typical soils throughout the State (beginning with those which represent the largest areas) to determine the total quantities of the various elements of plant in the soils, and the conditions in which it exists, both in virgin soil and in the long cropped and worn soil of the same type, in order to ascertain the effect of past and present systems of farming upon the stock of soil fertility and to furnish information as to the system of farming which should be adopted for the various types of soil so that fertility might be utilized and conserved.

3. Investigations should be made of various soils of the State which are representative of large areas and which present special difficulties; as, for example, the "scalds," the so called "dead dog," "bogus" or alkali lands, etc.

4. It was agreed that the experiment station should invite the co-operation of the division soils of the United States Department of Agriculture in beginning a soil survey of the State.

The committee voted to recommend to the trustee of the University of Illinois that they employ some competent person whose duties should include frequent reports to the press of the State regarding the work of the agricultural college and the progress of the agricultural experiments and investigations.

Professor Cyril G. Hopkins reports to the committee in regard to the progress of the work as follows:

"I have completed the work of locating experimental fields for soil investigations for this season, and am exceedingly busy in getting the work under way. The plan under which we are working is to select an experimental field whose soil shall be typical or representative of a large soil area. We take samples of soil from this field for analysis and also samples from one or two other similar fields in the vicinity which we shall also analyze and compare with the soil from experimental field. In addition to this we take, wherever possible, a sample of virgin soil from land adjacent to the experimental field.

The experimental fields selected are usually old and well worn soils, so that a comparison of the analysis of the virgin soil with that of the soil from the experimental field is expected to show the effect which has been produced by long years of cropping.

The experimental field is usually divided into two parts. On one of these we make applications of all the more important elements of fertility, both separately and in different combinations, and only one kind of crop will be grown upon this field; and even the first year's results, if the season is a normal one, should indicate what element or elements of fertility the soil may be deficient in, or whether it is not deficient in any of them. The other part of the experimental field is set apart for a series of rotation experiments in which a practical rotation is to be adopted, usually a three or four years rotation; and, in the rotation work, we will also test the effect upon the soil upon those important elements of fertility which the farmer must purchase if his soil is deficient in them, as phosphorus and potash, for example. We hope to ascertain whether it is necessary or profitable to purchase any commercial fertilizer where rotation of crops is practiced, and, if so, which of the elements of fertility should be purchased. We also hope to determine in the rotation experiments to what extent nitrogen can be accumulated from the atmosphere and to what extent leguminous crops should be grown in order to maintain sufficient supply of nitrogen in the soils for the most profitable crop production.

The first part of the experimental work, that is what we term straight fertility work, should yield valuable results the first year; but these straight fertility experiments are designed primarily to furnish information regarding the soil as quickly as possible. They are not to be considered in all cases as the thing to do in ordinary farm practice. For example we shall purchase the element nitrogen in the form of a commercial fertilizer and apply it to the land in order to determine as quickly as possible whether the soil needs more nitrogen, and if it does, then the thing for the land owner to do is not to purchase nitrogen in the market just as we have done, but to make a more liberal use of leguminous crops and thus secure his nitrogen from the free supply of the atmosphere. We purchase it for the experimental work because we thus put more nitrogen in the soil in a few days than we could accumulate by means of leguminous crops in the course of a year or two, and while the purchase of nitrogen is not considered practical for profitable crop production, it is practical for the purpose of securing information regarding the needs of the soil as quickly as possible. In rotation experiments, on the other hand, we hope to discover and to demonstrate just what should be done, and could profitably be done, in the regular line of practical farm work, but as you will readily understand, it will require several years before any conclusive results can be secured from rotation experiments. Thus, if we grow a leguminous crop next year it will require at least one more year before the effect of the leguminous crop upon the successive crop can be determined.

Another line of experiments which we are following, especially with abnormal soils, is to collect the soils in sufficient quantity so that we can conduct pot experiments here at the university in our glass-house to determine the effect upon the soil of various kinds of treatment. In this we are working more particularly upon soils which are reported to contain some injurious substances, and we hope to determine if this is really true, and, if so, if it can be removed or if its injurious effects can be corrected by any practical treatment.

We are now working in 15 different places in the State, including the one at Urbana, and we are not planning to locate any more fields this year.

The first year's work in which it is necessary to get this work started, lay out the fields, stake off the plots and purchase some materials, including some implements to be used in the application of fertilizers, necessarily render the experiments more expensive than they will be the second year, and it seems not improbable that we can expand further next year. At any rate it will be much more satisfactory to us and to the men with whom we are coöperating and to many other representative men over the State who are interested in this matter, to have the work expand or at least that we should continue all the work that we are now starting, rather than that we should begin more experiments now than we shall be able to keep up.

In selecting the experimental fields and in collecting soils for analysis we have endeavored to follow closely the general plan agreed upon by the committee from the State Farmers' Institute, and at the outset we are beginning experiments only upon soils which are representative of the largest and most important soil areas of the State, and we are not attempting to investigate local differences or peculiar soils of very limited areas, although it is recognized that there is need for investigating such soils and it is hoped that in the future years the work may be extended and expanded to cover many types of soils which we are not now able to work upon.

As representative of the hill soil in the extreme southern end of the State, probably the commonest type of old soil in the half dozen counties south of the Ozark Spurs, we have one field located near Vienna, in Johnson county, with Mr. J. M. Price.

As representative of the peculiar white soil of Washington, Marion, Clay, and a dozen other counties in that section of the State. we have located three experimental fields, one with Mr. A. A. Hinckley of DuBois, in Washington county, one with Col. N. B. Morrison, Odin, in Marion county, and one with Mr. Samuel Bartley of Edgewood, in Effingham county. The Odin field belongs to the type of rather low flat land, while the other two fields are somewhat higher and slightly rolling prairie.

As representative of the wheat lands of the south-west part of the State, we have located two experimental fields, one with Mr. W. E. Braden of Cutler, between Randolph and Perry counties, on the higher, lighter type of wheat soil, and one with Mr. John A. Rumer, on the farm of Geo. Postel of Mascoutah, in St. Clair county, on somewhat heavier and lower land.

As representative of the black prairie soil of the corn belt, comprising probably 25 counties through the central and north central part of the State, we have located four experimental fields beside the one at Urbana, namely, with Mr. F. A. Warner of Sibley, in Ford county; with Mr. S. Noble King of Bloomington, in McLean county, both of which are on somewhat high and rolling prairie land; with John Zeter of Lincoln, in Logan county, and with Mr. Geo. Conover of Virginia, Cass county, both on the heavier and low prairie land.

As representative of the extensive sandy soils in the north-west central part of the State, we have located an experimental field with Mr. J. C. Drake of Green Valley, in Tazwell county.

As representative of the extensive swamp lands in the northern part of the State, we have located two experimental fields, one with Mr. J. H. Milligan of Tampico, in Whiteside county, and one with C. C. Porter of Momence, in Kankakee county.

As representative of the hill soil in the extreme northern part of the State, we have located one experimental field with Mr. D. M. White of Antioch, in Lake county.

If there are any other special points as to the plans for the soil work regarding which you would like further information, I shall be glad to furnish it.

Very truly, yours,

CYRIL G. HOPKINS.

All of which is respectfully submitted for your thoughtful consideration.

WALTER R. KIMZEY, *Chairman*,
E. W. BURROUGHS,
RALPH ALLEN,
H. G. EASTERLY,
H. D. HUGHES, *Committee*.

On motion the report of the committee was adopted.

Director Allen moved that the secretary be instructed to have printed the report of the committee on soil investigations and experiments, with a synopsis of the board meeting, and send the same to the directors, county institute officers and the press of the State. Motion adopted.

Director Hughes moved the adoption of the amendment to the rules of the board so that the second meeting be held in May instead of June.

Amendment adopted by a unanimous vote.

Director Mann moved that the board adjourn to meet at the college of agriculture during the meeting of the Live Stock Breeders meeting.

Motion adopted and board adjourned.

Minutes read and approved, Feb. 25, 1902.

H. B. HOSTETTER, WALTER KIMZEY,
Secretary. *President.*

INSTITUTE ROOM, STATE HOUSE, Oct. 3, 1901.

The executive committee met on call of Chairman Kimzey at 4:00 o'clock p. m.

Present—Directors Frake, King, Shank and Kimzey.

The minutes of the previous meeting were read and approved.

The secretary presented the bills against the institute, which were examined in detail and reported as follows:

To the Board of Directors of the Illinois Farmers' Institute:

We, the members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1866	Guy R. Mathis, photographing libraries	$ 2 50
1867	A. C. McClurg & Co., library books	1 20
1868	Springfield Trunk Co., 15 library cases	41 25
1869	A. B. Hostetter, postage secretary's office	7 00
1870	Adams Express Co	3 08
1871	American Express Co	4 56
1872	Edw. F. Hartmann Co., printing and postage	71 50
1873	John Uuderfanger, drayage	35
1874	Mrs. Joseph Carter, for Illinois Association Domestic Science	12 91
1875	A. B. Hostetter, salary for August and September, 1901	250 00
1876	H. A. McKeene, janitor service	2 00
1877	H. D. Hughes, expenses as director	23 00
1878	Geo. A. Hunt, expenses as director	22 01
1879	Charles F. Mills, expenses as director	16 50
1880	A. B. Hostetter, expenses attending committee meeting	13 60
1881	J. M. Clark, cut for report, photo, etc	11 00
1882	E. W. Burroughs, expenses as director	48 75
1883	Ralph Allen, expenses as director	21 40
1884	A. W. Bryant, expenses as director	14 84
1885	S. Noble King, expenses as director	9 65
1886	William Stewart, expenses as director	12 25

Warrant No.	To Whom Payable.	Amount.
1887	Amos F. Moore, expenses as director	$11 30
1888	D. H. Shank, expenses as director	16 05
1889	F. I. Mann, expenses as director	9 35
1890	G. W. Dean, expenses as director	11 90
1891	W. R. Goodwin, expenses as director	13 00
1892	Mrs. Sara Steenberg, expenses as director	18 00
1893	H. D. Hughes, expenses as director	19 10
1894	W. R. Kimzey, expenses as director	59 93
1895	Joseph Newman, expenses as director	15 20
		$763 18

Approved Oct. 3, 1901.

JAMES FRAKE,
W. R. KIMZEY,
S. NOBLE KING,
D. H. SHANK,
Committee.

There being no other business, the committee adjourned.

Minutes read and approved Feb, 25, 1902.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

CHAMPAIGN, ILL., Nov. 20. 1901.

The board met as per adjournment in the parlors of the Beardsley hotel, Champaign, at 9 o'clock, A. M.

In the absence of President Kimzey, the meeting was called to order by Vice President King.

The following directors answered to roll call. Allen, Beal, Bryant, Coolidge, Dean, Easterly, Frake, Hughes, Hunt, Grout, King, Mann, Mills, Moore.

On motion of Director Frake, the reading of the minutes was omitted.

Chairman King announced that as each director had received a synopsis of the minutes that the minutes would stand approved if there were no objections.

Director Mills moved that a committee of three consisting of Directors King, Coolidge and Beal be a committee to report to the Illinois Farmers' Institute upon the work being done by and the needs of the College of Agriculture of the University of Illinois.

Motion adopted.

Arrangements having been made for the board to meet with the students of the College of Ariculture. Director Frake moved that Colonel Mills be appointed to address the students on behalf of the board.

Motion adopted.

On motion of Director Coolidge, the board adjourned to meet at the College of Agriculture with the agricultural students at 1 o'clock P. M., Thursday.

AGRICULTURAL COLLEGE, Nov. 21, 1901, 1 P. M.

The board met as per adjournment with the agricultural students at the above named time and place. After a short talk by Director Mills the directors were introduced to the students. The members of the board were much pleased with the appearance of the boys, and the enthusiasm with which they were engaging in their college work. The thought of what such a grand body of young men, when trained for their life work can do toward developing the agricultural resources of the State and uplifting the profession of farming has repaid the directors for all the efforts of the Illinois Farmers' Institute in behalf of the College of Agriculture. On motion the board adjourned to attend the sessions of the live stock breeders meetings.

Minutes read and approved, 1901.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

BEARDSLEY HOTEL, CHAMPAIGN, Nov. 21, 1901.

The Executive Committee met, as per call of the chairman, at above named time and place. In the absence of the chairman, Vice President S. Noble King acted as chairman. Present: Directors King, Beal and Frake. The following bills were taken up and examined, and the following report made thereon:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the Executive Committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1896	Schuyler County Farmers' Institute, J. W. Whitson, treasurer	$72 23
1897	Brown County Farmers' Institute, Robt. Bloomfield, treasurer	73 07
1898	Mason County Farmers' Institute, Miss Lena Paine, treasurer	75 00
1899	Hancock County Farmers' Institute, C. N. Dennis, treasurer	19 10
1900	Adams County Farmers' Institute, E. S. Frank, treasurer	33 18
1901	Henderson County Farmers' Institute, Carl Beal, treasurer	71 55
1902	Pulaski County Farmers' Institute, H. M. Hogendobler, treasurer	70 00
1903	Williamson County Farmers' Institute, A. M. Townsend, treasurer	75 00
1904	Clinton County Farmers' Institute, Joe Herman, treasurer	72 30
1905	Montgomery County Farmers' Institute, Edward Grimes, treasurer	75 00
1906	Bond County Farmers' Institute, Francis Dressor, treasurer	75 00
1907	Madison County Farmers' Institute, L. S. Dorsey, treasurer	75 00
1908	McDonough County Farmers' Institute, H. A. Knight, treasurer	75 00
1909	Fifteenth District Farmers' Institute, H. A. Knight, treasurer	11 90
1910	Fulton County Farmers' Institute, Geo. W. Shawyer, treasurer	75 00
1911	White County Farmers' Institute, Daniel Berry, treasurer	75 00
1912	Twentieth District Farmers' Institute, Daniel Berry, treasurer	50 00
1913	Edwards County Farmers' Institute, Ansel Gould, treasurer	75 00
1914	Pope County Farmers' Institute, Joe M. Baker,, treasurer	50 79
1915	Jackson County Farmers' Institute, Edw. Worthen, treasurer	75 00
1916	Sangamon County Farmers' Institute, L. H. Coleman, treasurer	70 00
1917	Hamilton County Farmers' Institute, C. H. Kornmeyer, treasurer	75 00
1918	Jefferson County Farmers' Institute, T. J. Holstlaw, treasurer	75 00
1919	Wabash County Farmers' Institute, Isaac W. Jaquess, treasurer	75 00
1920	Clay County Farmers' Institute, Chas. D. Duff, treasurer	69 68
1921	Wayne County Farmers' Institute, G. T. Beck, treasurer	75 00
1922	Christian County Farmers' Institute, E. A. Vanderver, treasurer	75 00
		$1,788 80

Warrant No.	To Whom Payable.	Amount.
1923	Adams Express Co	$ 3 30
1924	American Express Co	3 13
1925	Pacific Express Co	2 02
1926	United States Express Co	1 60
1927	A. B. Hostetter, postage and supplies secretary's office	10 80
1928	J. P. Sarver, stencil brush, etc	1 50
1929	Edward F. Hartmann Co., printing and postage	81 40
1930	A. B. Hostetter, salary for October, 1901	125 00
1931	H. A. McKeene, janitor service	2 00
1932	Western Union Telegraph Co	52
1933	Springfield Trunk Co., 18 library cases	53 10
1934	Frank Simmons, 340 books	252 65
1935	Frank Simmons, 340 books	225 00
1936	Eugene Davenport, expenses as director	11 10
1937	Geo. A. Hunt, expenses as director	17 58
1938	H. G. Easterly, expenses as director	52 67
1939	A. B. Hostetter, expenses of office at State fair grounds	2 00
1940	E. W. Burroughs, eqpenses as director	21 42
	Total	$866 79

Approved Nov. 21, 1901.

S. Noble King,
James Frake,
L. N. Beal,
W. R. Kimzey.

There being no other business the committee adjourned.

Minutes Read and approved Feb. 25, 1902.

Walter R. Kimzey,
President.

A. B. Hostetter,
Secretary.

Transit House, Chicago, Dec. 4, 1901.

The board of directors met as per adjournment at the above time and place. Roll call showed the following members present: Beal, Bryant, Burroughs, Coolidge, Clark, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Mills, Moore, Shank and Mrs. Steenberg.

On motion the reading of the minutes of the previous meeting was dispensed with.

Mrs. Steenberg moved that $50 be appropriated for holding an institute meeting in the Third congressional district. The roll being called on the adoption of the motion, it was carried by the following vote: Ayes—Beal, Bryant, Burroughs, Dean, Hughes, Hunt, Kimzey, King, Mann, Mills, Shank, Steenberg. Nays—Coolidge. Ayes, 12; nays, 1.

Director Mills moved that a committee be appointed on fat stock show.

Motion adopted.

The chairman appointed Directors Coolidge, Hughes and Mann as such committee.

Director Mills moved that the reports of directors to be submitted at the annual meeting of the Illinois Farmers' institutes cover the agricultural conditions of their respective districts and the best methods to be adopted by county institutes for aiding in the promotion of agriculture in the several counties.

Motion adopted.

On motion the board adjourned.

Minutes read and approved Feb. 25, 1902.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

CHICAGO, Dec. 5, 1901.

The committee met at the Transit House, Chicago, as per the call. Present—Directors Beal, Kimzey, King, Frake and Shank.

The secretary presented bids for printing the programs for the annual meeting.

Director King moved that the bid of Edw. F. Hartmann Co., being the lowest bid, that the contract be let to that firm.

Motion adopted.

Director Beal moved that the secretary be instructed to have 700 programs printed for the annual meeting at Rockford.

Motion adopted.

Director Frake moved that Director King be appointed a committee to represent the Illinois Farmers' Institute at a conference of agcultural associations in the interest of an exhibit at the Louisiana Purchase Exposition, and that his necessary expenses as such committee be paid by the institute.

Motion adopted.

The secretary presented the following inventory of the property belonging to the Illinois Farmers' Institute, which he had stenciled and which is in the rooms of the board in the State House:

One roll-top oak desk.
One long four-drawer oak table.
One leather lounge.
Two oak two-drawer library card filing cases.
One oak framed mirror.
One rack for agricultural papers.
One Smith-Premier typewriter, No. 16931.

Director Shank moved that the secretary procure rubber stamps for the new officers and directors.

Motion adopted.

On motion the committee adjourned to the Sherman House to take up and audit the various bills presented by the secretary, upon which the following report was made:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the several claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1941	W. A. Henry, for ten copies "Feeds and Feeding"	$ 12 50
1942	Frank Simmons, domestic science books	73 82
1943	A. B. Hostetter, for ten vols. "Life," etc	8 30
1944	John Underfanger, drayage	35
1945	American Express Co	4 37
1946	Adams Express Co	1 97
1947	A. B. Hostetter, salary for November, 1901	125 00
1948	A. W. Bryant, expenses as director	15 75
1949	H. G. Easterly, expenses as director	16 32
1950	S. Noble King, expenses as director	9 46
1951	Ralph Allen, expenses as director	8 92
1952	J. H. Coolidge, expenses as director	28 70
1953	Geo. A. Hunt, expenses as director	17 65
1954	G. W. Dean, expenses as director	20 90
1955	H. D. Hughes, expenses as director	16 64
1956	L. N. Beal, expenses as director	39 75
1957	James Frake, expenses as director	4 75
1958	Geo. A. Hunt, expenses as director, Champaign	5 55
1959	A. B. Hostetter, expenses board meeting	11 35
1960	E. W. Burroughs, expenses as director	26 00
1961	W. R. Kimzey, expenses as director	74 88
1962	F. I. Mann, expenses as director	13 55
1963	Chas. F. Mills, expenses as director	12 06
1964	Amos F. Moore, expenses as director	28 90
1965	G. W. Dean, expenses as director	20 75
1966	L. N. Beal, expenses as director	19 35
1967	D. H. Shank, expenses as director	29 15
1968	A. B. Hostetter, expenses board meeting, Chicago	15 55
1969	H. D Hughes, expenses as director	12 00
1970	S. Noble King, expenses as director	11 23
1971	Joseph Newman, expenses as director	5 20
	Total	$690 67
1972	Perry County Farmers' Institute, W. T. White, treasurer	$75 00
1973	Washington County Farmers' Institute, E. P. Seibert, treasurer	75 00
1974	Marion County Farmers' Institute, T. S. Marshall, treasurer	75 00
1975	Twenty-first District Institute, T S. Marshall, treasurer	50 00
1976	Morgan County Farmers' Institute, E. D. Smith, treasurer	75 00
1977	Richland County Farmers' Institute, Frank Britton, treasurer	75 00
1978	Union County Farmers' Institute, D. W. Karraker, treasurer	59 00
1979	Randolph County Farmers' Institute, W. C. Patton, treasurer	75 00
1980	Alexander County Farmers' Institute, James Miller, treasurer	55 50
1981	Shelby County Farmers' Institute, W. S. Middlesworth, treasurer	38 57
	Total	$653 07

Approved Dec. 5, 1901.

WALTER R. KIMZEY,
S. NOBLE KING,
L. N. BEAL,
D. H. SHANK,
JAMES FRAKE,
Committee.

There being no other business, the committee adjourned.

Minutes read and approved Feb. 25, 1902.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, Feb. 4, 1902.

The executive committee of the Illinois Farmers' Institute met as per call of the chairman. Present, Directors Kimzey, King, Beal and Shank.

The minutes of the meetings of November 21, 1901 and December 5, 1901, were read and approved.

Director Bayliss, chairman of the library committee, submitted the following report:

FEBRUARY 4, 1902.

To the Executive Committee Illinois Farmers' Institute:

WHEREAS, the aggregate number of books in the farmers' institute free libraries is now nearly 6,000, involving many hundred different titles, and the purchases from the current appropriation being completed, the library committee recommends that the secretary be authorized to prepare an alphabetical list of books now on hand, and have printed 250 copies for the use of patrons of the library, as well as a guide for himself and the library committee in making future selections.

ALFRED BAYLISS, *Chairman.*
WALTER R. KIMZEY.

Director King moved that the report be accepted and the secretary authorized to have the lists printed in accordance therewith.

Motion adopted.

Director Shank moved that the secretary be instructed to secure 300 ribbon badges for the delegates at the State Institute at Rockford and for the officers and directors.

Motion adopted.

Director Beal moved that the sixth annual report be distributed as follows: 80 copies to each director, 60 to each county, to be divided between the county farmers' institute officers, and the balance to be distributed through the secretary's offices.

Motion adopted.

The following reports from county farmers' institutes and bills for expenses of the board were taken up and reported upon as follows;

To the Board of Directors of the Illinois Farmers' Institute:

We the undersigned members of the executive committee having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
1982	Stark County Farmers' Institute, Irwin Nowlan, treasurer	$59 88
1983	Cumberland County Farmers' Institute, A. H. Ganaway, treasurer	61 75
1984	Henry County Farmers' Institute, J. B. Hanlon, treasurer	75 00
1985	Woodford County Farmers' Institute, F. H. Kauffman, treasurer	74 01
1986	Crawford County Farmers' Institute, Alex. Delzell, treasurer	64 02
1987	Lawrence County Farmers' Institute, Robt. Kingsbury, treasurer	61 33
1988	Macoupin County Farmers' Institute, Edward Chiles, treasurer	75 00
1989	Pike County Farmers' Institute, Sam. Morgan, treasurer	75 00
1990	St. Clair County Farmers' Institute, L. B. Eidman, treasurer	75 00
1991	Monroe County Farmers' Institute, William Limestall, treasurer	75 00
1992	Clark County Farmers' Institute, G. W. Tobias, treasurer	49 35
1993	Scott County Farmers' Institute, F. F. Clark, treasurer	75 00
1994	Tazewell County Farmers' Institute, John Schrock, treasurer	75 00
1995	Douglas County Farmers' Institute, John Burkey, treasurer	75 00
1996	Jasper County Farmers' Institute, A. A Nees, treasurer	74 50
1997	Johnson County Farmers' Institute, R. W. Alsbrook, treasurer	75 00
1998	Massac County Farmers' Institute, J. F. McCartney, treasurer	75 00
1999	22nd District Farmers' Institute, J. F. McCartney, treasurer	48 35
2000	Jersey County Farmers' Institute, J. W. Becker, treasurer	75 00
2001	16th District Farmers' Institute, J. W. Becker, treasurer	50 00
2002	Coles County Farmers' Institute, H. F. Hill, treasurer	75 00
2003	Greene County Farmers' Institute, John F. Calloway, treasurer	75 00
2004	Saline County Farmers' Institute, C. H. Burnett, treasurer	61 93
2005	Winnebago County Farmers' Institute, Theron Pierpont, treasurer	75 00
2006	Hancock County Farmers' Institute, C. N. Dennis, treasurer	25 56
2007	Stephenson County Farmers' Institute, Frank B. Walker, treasurer	75 00
2008	Iroquois County Farmers' Institute, H. C. Center, treasurer	75 00
2009	LaSalle County Farmers' Institute, F. M. Higgins, treasurer	75 00
2010	Menard County Farmers' Institute, W. D. Masters, treasurer	75 00
2011	DeKalb County Farmers' Institute, B. F. Wyman, treasurer	75 00
2012	Putnam County Farmers' Institute, Geo N. Hayslip, treasurer	68 20
2013	Moultrie County Farmers' Institute, D. D. Frantz, treasurer	75 00
2014	18th District Farmers' Institute, D. C. Frantz, treasurer	49 85
2015	Marshall County Farmers' Institute, A. C. Garvin, treasurer	75 00
2016	14th District Farmers' Institute, A. C. Garvin, treasurer	33 70
		$2,357 43
2017	Franklin County Farmers' Institute, C. Moore, treasurer	$ 75 00
2018	Ogle County Farmers' Institute, Frank Linn, treasurer	75 00
2019	McLean County Farmers' Institute, John F. Moore, treasurer	75 00
2020	Gallatin County Farmers' Institute, W. A. Peeples treasurer	75 00
2021	Hardin County Farmers' Institute, Edw. Schneider, treasurer	53 75
2022	Effingham County Farmers' Institute, Chas. Mitchell, treasurer	75 00
2023	19th District Farmers' Institute, Chas. Mitchell, treasurer	50 00
2024	Macon County Farmers' Institute, Chas H. Scoot, treasurer	75 00
2025	G. W. Dean, expenses as director	9 20
2026	J. H. Coolidge, expenses as director	32 24
2027	S. Noble King, expenses as director	19 36
2028	Chas. F. Mills, expenses as director	13 25
2029	A. B. Hostetter, expenses committee meeting	21 65
2030	A. W. Bryant, expenses as director	12 23
2031	S. Noble King, expenses as director	26 29
2032	A. B. Hostetter, salary for December 1901	125 00
2033	H. G. Easterly, expenses as director	84 16
2034	Edw. F. Hartmann Co., printing	175 25
2035	A. B. Hostetter, postage, secretary's office	24 00
2036	Adams Express Co	7 87
2037	United States Express Co	10 39
2038	American Express Co	14 41
2039	John Underfanger, freight and drayage	6 40
2040	H. A. McKeene, janitor service	10 00
2041	J. W. Dodd, printing	9 75
2042	W. A. Henry, 20 vols., feed and feeding, free liabrary	25 00
2043	Public School Publishing Co., 10 volumes free library	4 35
2044	A. B. Hostetter, office help for free library	52 00

Warrant No.	To Whom Payable.	Amount.
2045	Springfield Trunk Co., 20 cases for free library	$ 85 55
2046	Frank Simmons, 80 volumes for free library	53 11
2047	Frank Simmons, 330 volumes for free library	231 00
2048	Frank Simmons, 340 volumes for free library	267 20
2049	Frank Simmons, 330 volumes for free library	202 40
2050	Mrs Joseph Carter, domestic science books for free libraries	21 88
2051	Mrs. Joseph Carter, expenses Illinois Association Domestic Science	27 95
2052	Mrs. S. Noble King, expenses Illinois Association Domestic Science	66 15
2053	Mrs. S. Noble King, expenses Illinois Association Domestic Science	13 15
2054	A. B. Hostetter, salary for January, 1902	125 00
2055	A. B. Hostetter, postage, secretary's office	25 00
2056	S. Noble King, expenses as director	7 35
2057	L. N. Beal, expenses as director	13 94
2058	D. H. Shank, expenses as director	18 12
2059	W. R. Kimzey, expenses as director	53 12
2061	Livingston County Farmers Institute, J. W. McDowell, treasurer	75 10
		$2,522 47

Approved Feb. 4, 1902.

WALTER R. KIMZEY,
L. N. BEAL,
D. H. SHANK,
S. NOBLE KING.

There being no further business the committee adjourned.

Minutes read and approved Feb. 25, 1002.

A. B. HOSTETTER,
Secretary.

WALTER R. KIMZEY,
President.

NELSON HOUSE, ROCKFORD, Feb. 18 to 21, 1902.

The executive committee met as per call of the chairman on the evening of the 18th, and remained in session from time to during the above dates auditing the bills presented, upon which the following report was made:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
2063	O. E. Bradfute, for expenses as speaker State meeting	$ 53 20
2064	John T. Galbraith, for expenses as clerk committee on credentials	29 90
2065	J. L. Hartwell, expenses speaker State meeting	12 31
2067	Virginia C. Meredith, expenses speaker State meeting	53 35
2068	Mrs. Joseph Carter, expenses Mrs. Rorer State meeting	6 90
2069	W. U. Telegraph Co., messages State meeting	4 58
2070	Chamberland, Knight & Co., opera house State meeting	300 00
2071	W. L. Frisbie, express on programs State meeting	3 65
2072	A. J. Glover, expenses speaker State meeting	5 36
2073	Irvine Nowlan, expenses speaker State meeting	12 00
2074	Miss Sarah Hostetter, expenses speaker State meeting	5 44
2075	H. A. Aldrich, expenses speaker State meeting	21 75

Watrant No.	To Whom Payable.	Amount.
2076	F. D. Voris, expenses speaker State meeting	$21 75
2077	L. H. Kerrick, expenses speaker State meeting	16 61
2078	James Frake, expenses as director State meeting	11 60
2079	Mrs S. Noble King, expenses Ill. Ass'n. Domestic Science State meeting	18 33
2080	Mrs Joseph Carter, expenses Ill. Ass'n Domestic Science State meeting	27 08
2081	S. Noble King, expenses as director State meeting	20 78
2082	Chas. F. Mills, expenses as director State meeting	21 90
2083	G W. Dean, expenses as director State meeting	21 50
2084	E. N. Cobb, expenses speaker Stale meeting	17 00
	Total	$674 99
2062	Cook County Farmers' Institute, James Frake, treasurer	$73 99
2085	Lee County Farmers' Institute, Collins Dysart, treasurer	75 00
2086	Boone County Farmers' Institute, Luther Lawrence, treasurer	75 00
2087	Knox County Farmers' Institute, W. McCornack, treasurer	75 00
2088	Tenth District Farmers' Institute, W. McCornack, treasurer	11 39
2089	Logan County Farmers' Institute, John Zeter, treasurer	75 00
2090	Seventeenth District Farmers' Institute, John Zeter, treasurer	50 00
2001	Kendall County Farmers' Institute, A. C. C. Gabel, treasurer	75 00
2092	JoDaviess County Farmers' Institute, P. T. Hicks, treasurer	75 00
2093	Ninth District Farmers' Institute, P. T. Hicks, treasurer	50 00
2094	Vermilion County Farmers' Institute, M. J. Walford, treasurer	75 00
2095	DeWitt County Farmers' Institute, H. C. Cline, treasurer	75 00
2006	Grundy County Farmers' Institute, William Reardon, treasurer	75 00
2097	Eight District Farmers' Institute, William Reardon, treasurer	50 00
2098	Peoria County Farmers' Institute, William West, treasurer	75 00
2099	Fayette County Farmers' Institute, R. T. Higgins, treasurer	58 48
2100	Lake County Farmers' Institute, O. B. Whitmore, treasurer	75 00
2101	Seventh District County Farmers' Institute, O. B. Whitmore, treasurer	50 00
2102	McHenry County Farmers' Institute, F. C. Wells, treasurer	75 00
2103	Piatt County Farmers' Institute, C. J. Bear, treasurer	75 00
	Total	$1,318 86

Approved Feb. 21, 1902.

Director Frake moved to accept the offer of the Pantagraph to mail 250 copies each of three weekly editions of the Pantagraph containing full reports of the seventh annual institute and board meeting to the lists of institute officers to be furnished by the secretary at 3 cents per copy. The roll being called the motion was adopted by the following vote: Ayes—Frake, King, Kimzey, Beal and Shank. Nays—none.

On motion the committee adjourned.

Minutes read and approved Feb. 25, 1902.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, Feb. 25, 1902.

The executive committee met on call of the chairman at 10:30 a. m and 4 p. m. Present Directors Kimzey, Shank, Beal, King and Frake.

Bills and reports of county institutes were taken up and audited and the following report made on same:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No.	To Whom Payable.	Amount.
2104	Kankakee County Farmers' Institute, L. W. Smith, treasurer	$75 00
2105	12th District Farmers' Institute, L. W. Smith, treasurer	49 70
2106	Ford County Farmers' Institute, D. A. Taylor, treasurer	75 00
2107	Edgar County Farmers' Institute, C. D. Smith, treasurer	75 00
		$274 70
2108	E. Davenport, expenses speaker at Rockford	$22 39
2109	Joseph Carter, expenses speaker at Rockford	12 15
2110	J. C. Blair, expenses speaker at Rockford	28 81
2111	Mrs. E. Davenport, expenses speaker at Rockford, Ill. Ass'n Domestic Science	22 33
2112	Alfred Bayliss, expenses speaker at Rockford	21 05
2113	P. G. Holden, expenses speaker at Rockford	23 00
2114	H. M. Mumford, expenses speaker at Rockford	25 61
2115	R. S. Woodrow, expenses speaker at Rockford	18 22
2116	A. B. Hostetter, expenses at Rockford	33 75
2117	L. N. Beal, expenses as director	17 69
2118	D. H. Shank, expenses as director	37 45
2119	E. W. Burroughs, expenses as director	15 35
2120	A. W. Bryant, expenses as director	34 82
2121	L. N. Beal, expenses as director	38 04
2122	Amos F. Moore, expenses as director	47 32
2123	J. H. Coolidge, expenses as director	36 50
2124	F. I. Mann, expenses as director	33 30
2125	H. D. Hughes, expenses as director	52 00
2126	W. R. Kimzey, expenses as director	61 12
2127	G. W. Dean, expenses as director	12 28
2128	H. G. Easterly, expenses as director	48 65
2129	Mrs. Sara Steenberg, expenses as director	12 25
2130	Geo. A. Hunt, expenses as director	38 23
2131	H. A. McKeene, janitor service, etc	5 00
2132	A. B. Hostetter, assistance library work	50 00
2133	Mrs. Sara Steenberg, expenses as director	17 80
2134	H. M. Dunlap, expenses as director	13 40
2135	Mrs. H. M. Dunlap, expenses at Rockford, Illinois Ass'n Domestic Science	21 30
2136	E. Davenport, expenses as director	10 08
2137	S. Noble King, expenses as director	7 15
2138	James Frake, expenses as director	8 50
	Total	$825 54

Approved Feb. 25, 1902.

WALTER R. KIMZEY,
D. H. SHANK,
L. N. BEAL,
JAMES FRAKE,
S. NOBLE KING,
Committee.

On motion the secretary was instructed to return the bills of A. D. Shamel and Fred H. Rankin for expenses at Rockford to be itemized in regard to hotel expenses.

On motion the committee adjourned.

Minutes read and approved Feb. 25, 1992.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary

INSTITUTE ROOM, STATE HOUSE, Feb. 25, 10:30 a. m.

The board of directors of the Illinois Farmers' Institute met at the above time and place, as per the Statutes.

Roll call showed the following members present: Beal, Bryant, Coolidge, Davenport, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Moore, Shank, Steenberg; total, 16.

The minutes of the board meetings of Nov. 21 and Dec. 5 were read and approved. The minutes of the meetings of the executive committee of Nov. 21, 1901, Dec. 5, 1901, Feb. 4, 1902, and Feb. 21, 1902, were read and on motion the actions of the executive committee were approved.

The secretary made the following reports:

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—This being the close of the year I beg leave to report that in addition to the property, "stenciled the property of the Illinois Farmers' Institute," and reported to the executive committee Dec. 5, 1902, there belongs to the Farmers' Institute—

One flag.
One gavel.
Twenty-two letter-filing cases of letters.
One account book.
Four books of records of minutes of board meetings.
One record book of delegates to annual meetings.
One book of order blanks on the Auditor of State.
Three warrant books.
Several hundred envelopes, and a liberal supply of blanks of various kinds for office and library work, and library cards.
Fifty cents in postage.
One hundred fourteen library cases.
One hundred eleven libraries containing a total of 5,392 volumes, 3,912 of which are of general literature and 1,480 books of reference, consisting of government publications, bound Farmers' Bulletins, Horticultural Society, Dairymen's Association, Public Instruction, and Farmers' Institute reports, only the current annual reports being counted.
One hundred fifteen volumes on domestic science, in care of the secretary of the Illinois Association of Domestic Science.
Ten volumes each of "Diseases of Cattle" and "Diseases of the Horse" for future libraries.
One tin box with lock, for papers.

The Institute supply of annual reports has been exhausted and but few are on hand which have been received from the Secretary of State from time to time.

The above includes all the property of the Institute except the smaller desk articles and is submitted as a matter of record.

Respectfully submitted,
A. B. HOSTETTER,
Secretary.

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—The following is a correct statement of the amounts paid out for the several funds since the last report of the auditing committee Aug. 26, 1901, and the amounts to the credit of each fund on Feb. 22, 1902:

Amounts as per the Auditor's report—

Fund No. 1	Expressage, postage and office supplies	$1,366 33
Fund No. 2	Salaries and clerk hire	2,010 00
Fund No. 3	Libraries	2,511 47
Fund No. 4	General expenses	2,061 02
Fund No. 6	District institutes	1,052 23
Fund No. 7	Illinois Association Domestic Science	500 00
Contingent fund		1,700 00
		$11,204 74

By the order of the board the following transfers were made to and from the several funds:

To fund No. 1, $70.73, transferred from No. 2.

From fund No. 2, $114.00, transferred to Nos. 1 and 4.

From No. 3, $11.47, transferred to No. 4.

To No. 4, $300.66.

From No. 6, $252 23, transferred to No. 4.

Making the amount available to each fund, paid out, and balance Feb. 22, 1902—

Fund No.	Amount Available.	Paid Out.	Balance Feb. 22, 1902.
1	$1,437 06	$ 607 58	$ 829 48
2	1,896 00	1,085 00	811 00
3	2,500 00	2,346 00	154 00
4	2,371 68	2,322 78	48 90
6	800 00	555 19	244 81
7	500 00	157 89	342 11
Contingent	1,700 00		1,700 00
	$11,204 74	$7,074 44	$4,130 30

Respectfully submitted,

A. B. HOSTETTER,
Secretary.

On motion the reports of the secretary were approved and ordered placed on file and the financial report referred to the auditing committee.

Statement of A. P. Grout, treasurer Illinois Farmers' Institute, February 22, 1902:

Fund.		On hand.		Paid out.		Balances
1	August 26.............	$1,366 33				
1	Received No. 2........	70 73	$1,437 06	$607 58	Warrants.............	$829 48
2	August 26.............	$2,010 00	2,010 00	1,085 00	Warrants.............	
				70 73	Credit fund No. 1....	
				43 27	Credit fund No. 4....	811 00
				$1,199 00		
3	August 26.............	$2,511 47	2,511 47	$2,346 00	Warrants.............	
				11 47	Credit fund No. 4....	154 00
				$2,357 47		
4	August 26.............	$2,078 43				
	Received No. 2.......	43 27				
	Received No. 3.......	11 47				
	Received No. 6.......	252 23				
	Unpaid warrant......	3 69	2,389 09	$1,655 48	Warrants.............	733 61
5	August 26.............	$ 93 55				
	Received fund Dec. 9, 1891...............	1,656 90				
	Received fund Dec. 19, 1891...............	673 07				
	Received fund Jan. 28, 1892...............	1,481 77	3,905 29	$5,008 24	Warrants overdrawn	1,102 95
6	August 26.............	$1,052 23	1,052 23	$343 80	Warrants.............	
				252 23	Credit fund No. 4....	456 20
				$596 03		
7	August 26.............	$500 00	500 00	$157 89	Warrants.............	342 11
8	August 26.............	$1,700 00	1,700 00	....	....	1,700 00
	Totals.............		$15,505 14	$11,581 69		$5,026 40
	Less fund No 5, overdrawn.........					1,102 95
	Balance on hand February 22, 1902.........					$3,923 45

Respectfully submitted,

A. P. Grout,

Treasurer.

On motion the treasurer's report was referred to the auditing committee and placed on file.

The auditing committee reported as follows:

SPRINGFIELD, Feb. 24, 1902.

To the President and Board of Directors, Illinois Farmers' Institute:

GENTLEMEN:—We your auditing committee beg leave to report that we have made a careful examination of the books, warrants, bills, etc., of Treasurer A. P. Grout and Secretary A. B. Hostetter, and desire to make the following report:

According to the action of the executive committee Aug. 30, 1901, warrants Nos. 1153, 1297, 1357, 1395, amounting to $3.69, were cancelled, and that amount was placed to the credit of fund No. 4; at the same time the following transfers were ordered: Fund No. 1, office expenses, etc., $70.73. transferred from fund No. 2; from fund No. 2, $70.73, to fund No. 1, and $43.27 to fund No. 4; from fund No. 3, $11.47; to No. 4, $43.27, from fund No. 2, $11.47; from No. 3, and $252.23 from fund No. 6; from fund No. 6, $252.23 to fund No. 4, and thus counting transfers to a fund as receipts, and from a fund with expenditure, the treasurer's book shows:

Fund No.	Balance Aug. 26, 1901.	Receipts Aug. 26, 1901, to Feb. 24, 1902.	Paid out Aug. 26, 1901, to Feb. 24, 1902.	Balance Feb. 24, 1902.
1	$1,366 33	$ 70 73	$ 607 58	$ 829 48
2	2,010 00		1,199 00	811 00
3	2,511 47		2,357 47	154 00
4	2,078 43	$310 66	1,655 48	733 61
6	1,052 23		596 03	456 20
7	500 00		157 89	342 11
Contingent	1,700 00			1,700 00
Total	$11,218 46	$381 39	$6,573 45	$5,026 40

Thus figuring a total of funds from this source of $5,026.40 in hands of Treasurer A. P. Grout.

On the secretary's report, the same four old warrants, viz.: Nos. 1153, 1297, 1357 and 1385, amounting to $3.69, were cancelled, and a like amount added to fund No. 4.

Identically the same transfers from one fund to another were made by the secretary as by the treasurer above.

A critical comparison of the secretary's and treasurer's books shows that the following warrants against the funds No. 4 and No. 6 have been drawn by the secretary and not presented to the treasurer for payment:

Fund No. 4—	
1749	$ 1 00
1820	8 72
2063	53 20
2064	29 90
2065	12 31
2067	53 35
2068	6 90
2069	4 58
2070	300 00
2071	3 65
2072	5 36
2073	12 00
2074	5 44
2075	21 75
2076	21 75
2077	16 61
2078	11 60
2079	18 33
Fund No. 4—*Concluded.*	
2080	17 08
2081	20 78
2082	21 90
2083	21 50
2084	17 00
Total	$684 71
Fund No. 6—	
2088	$11 39
2090	50 00
2093	50 00
2097	50 00
2101	50 00
Total	$211 39

Counting, therefore, *to* a fund as receipts and *from* a fund as disbursements, the secretary's books show as follows:

Fund No.	Balance Aug. 26, 1901.	Receipts.	Drawn.	Balance Feb. 24, 1901.
1	$1,366 33	$ 70 73	$ 607 58	$ 829 48
2	2,010 00		1,199 00	811 00
3	2,511 47		2,357 47	154 00
4	2,061 02	310 66	2,322 78	48 90
6	1,052 23		807 42	244 81
7	500 00		157 89	342 11
Contingent	1,700 00			1,700 00
Total	$11,201 05	$381 39	$7,452 14	$4,130 30

Thus leaving a total of $4,130.30 to be drawn against, distributed among the several funds as shown above.

Respectfully submitted,

E. W. BURROUGHS,
WALTER R. KIMZEY,
H. G. EASTERLY,
H. D. HUGHES,
GEO. A. HUNT,
Auditing Committee.

Director King moved that the report of the auditing committee be approved and placed on file.

Motion adopted.

Mrs. Steenberg, chairman of the committee on Domestic Science Association, offered the following resolutions and moved their adoption:

Resolved, That a list of speakers on domestic science be furnished by the president and secretary of the Illinois Association of Domestic Science.

Resolved, That the legislative committee of the Illinois Association of Domestic Science be authorized to ask for an appropriation from the legislature for the Illinois Association of Domestic Science sufficient for necessary expenses for the coming two years.

Resolutions adopted.

The following letter from the Agricultural Club of the University of Illinois was read by the secretary:

CHAMPAIGN, ILL., Dec. 7, 1901.

Directors of the Illinois Farmers' Institute, Springfield, Ill.

DEAR SIRS—The following resolutions have been adopted and approved by the Agricultural Club of the University of Illinois:

WHEREAS, The Illinois Farmers' Institute has been instrumental in securing annually a free scholarship in the college of agriculture for each county in the State; and

WHEREAS, The director of each district of the State has granted them to us who are now here at the University of Illinois; and

WHEREAS, Many of us could not have had the privilege of attending the university without the aid of a scholarship; therefore, be it

Resolved, That we students of the college of agriculture of the University of Illinois and members of the Agricultural Club do earnestly thank the directors of the Illinois Farmers' Institute for the benefits they have been instrumental in granting to us; and be it

Resolved, That each member who has been the beneficiary of a scholarship do all in his power to promote the interests of the university, and to aid in any way the cause of agriculture wherever he may be called; and be it further

Resolved, That a copy of these resolutions be sent to the secretary of the Illinois Farmers' Institute, and that a copy be spread upon the records of the club.

D. S. Dalbey,
I. O. Finley,
Committee.

J. E. Kincaid, *Secretary.*

Director Allen moved that the resolutions be spread upon the records of the board meeting.

Motion adopted.

Director Burroughs, chairman of the auditing committee, moved that $1,000 of the contingent fund be appropriated to the general fund No. 4.

The roll being called, the motion was adopted by the following vote: Ayes: Beal, Bryant, Burroughs, Coolidge, Davenport, Dean, Easterly, Frake, Grout, Hughes, Hunt, Kimzey, King, Mann, Moore, Steenberg—total ayes, 16; nays, 0.

Director Hughes moved that a committee of three be appointed to draft resolutions of respect for the retiring members.

Motion adopted.

The chairman appointed Directors Frake, Davenport and Moore as such committee.

On motion the board adjourned till 7:30 p. m.

Institute Room, 7:30 p. m.

The board met as per adjournment, the same members present as at the preceding session.

Director Burroughs, chairman of the auditing committee made the following report:

Springfield, Ill., Feb. 25, 1902.

To the Board of Directors of the Illinois Farmers' Institute.

Gentlemen—We, your committee, beg leave to report the following as supplemental to that submitted this morning, thus auditing the secretary's books and accounts for the institute year now ended, and showing the actual standing of each of the several funds on the secretary's books at the close of this term of office.

According to the action of the board $1,000 was transferred from the contingent fund to fund No. 4, making the balances of the several funds as follows:

Fund No.	For What Purpose.	Amount.
1	Expressage, postoffice expenses, etc	$ 829 48
2	Salaries, clerk hire, etc	811 00
3	Free libraries	154 00
4	General expenses of the board, etc.	1,048 90
6	District institutes	244 81
7	Domestic science	342 11
Contingent		700 00
	Total	$4,130 30

Since morning the following warrants have been issued and have not been presented for payment:

Fund No. 2—	
2131	$5 00
Fund No. 3—	
2132	$50 00
Fund No. 4—	
2108	$22 39
2109	12 15
2110	28 81
2111	22 33
2112	21 05
2113	23 00
2114	25 61
2115	18 22
2116	38 75
2117	17 69
2118	37 45
2119	15 35
2120	34 82
Fund No. 4—*Concluded.*	
2121	$38 04
2122	47 32
2123	36 50
2124	33 30
2125	52 00
2126	61 62
2127	12 28
2128	48 65
2129	12 25
2130	38 23
2133	17 80
2134	13 40
2135	21 30
2136	10 08
2137	7 15
2138	8 50
Total	$770 54
Fund No. 6—	
2105	$49 70

Therefore the various funds in the secretary's books are as follows:

Fund No.	Balance.	Drawn.	Present Balance.
1	$ 829 48		$829 48
2	811 00	$ 5 00	806 00
3	154 00	50 00	104 00
4	1,048 90	770 54	278 36
6	244 81	49 70	195 11
7	342 11		342 11
Contingent	700 00		700 00
Total	$4,130 30	$875 24	$3,255 06

Respectfully submitted,

E. W. BURROUGHS,
H. G. EASTERLY,
GEO. A. HUNT,
H. D. HUGHES,
WALTER R. KIMZEY,
Committee.

On motion of Director Clark the report of the committee was approved and ordered placed on file.

Director Frake, chairman of the committee on resolutions, reported as follows:

WHEREAS, The term of office of the following named persons have expired, viz.: Hon. Chas. F. Mills, Senator G. W. Dean, L. N. Beal, Esq. D. H. Shank, Esq. Walter R. Kimzey, president, W. R. Goodwin, Mrs. Sarah Steenberg, George A. Hunt and A. W. Bryant; and

WHEREAS, We recognize in gentlemen, Chas. F. Mills, G. W. Dean, L. N. Beal and D H. Shank, directors who have been connected with the board from its beginning, and to whose labors therefore the institute very largely owes its success; therefore be it

Resolved, That we take this occasion to express our appreciation of the labors of the retiring members, especially of the long continued and self sacrificing services of those directors especially mentioned;

Resolved, That we hereby express our appreciation of the prompt and impartial manner our president, Walter R. Kimzey, has presided over the meetings of the board the past year.

JAMES FRAKE,
E. DAVENPORT,
AMOS F. MOORE,
Committee.

On motion the resolutions were adopted by a unanimous vote.

There being no further business, on motion of Director Frake the board adjourned *sine die*.

Minutes read and approved Feb. 25, 1902.

WALTER R. KIMZEY,
President.

A. B. HOSTETTER,
Secretary.

ANNUAL REPORTS OF COUNTY FARMERS' INSTITUTES FOR THE YEAR JULY, 1901 TO JULY, 1902.

Adams County—Held two institutes: One at Golden Oct. 18 and 19, 1901; cost, $33.18; average daily attendance, 300. The other at Camp Point Feb. 28 and March 1, 1902; cost, $41.24; average daily attendance, 200. Officers elected for the ensuing year: President, E. L. Grosh, Mendon; secretary, J. E. Simmonds, Camp Point, treasurer, E. S. Frank, Clayton.

Alexander County—Institute held at Thebes Nov. 22 and 23, 1901; cost, $55.50; average daily attendance, 200. Officers elected for the ensuing year: President, Cyrille A. Marchildon, Thebes; secretary, J. T. McClure, McClure; treasurer, James Miller, Thebes.

Bond County—Institute held at Sorento Nov. 29 and 30, 1901; cost, $81.07; average daily attendance, 200. Officers elected for the ensuing year: President, J. H. Denny, Sorento; secretary, Rufus Cruthis, Sorento; treasurer, Francis Dressor, Sorento.

Boone County—Institute held at Belvidere Jan. 28,29 and 30, 1902; cost, $96.98; average daily attendance, 300. Officers elected for the ensuing year: President, B. S. Herbert, Belvidere; secretary, Walter Lucas, Belvidere; treasurer, Luther Lawrence, Belvidere.

Brown County—Institute held at Mt. Sterling Oct. 8 and 9, 1901; cost, $73.07; average daily attendance, 300. Officers elected for the ensuing year: President. C. J. Davis, Mounds; secretary, Robert Means, Hersman; treasurer, Robert Bloomfield, Mt. Sterling.

Bureau County—Institute at Tiskilwa Feb. 5 and 6, 1902, with the Eleventh Congressional district meeting; cost, $126.07; average daily attendance, 1,000. Officers elected for the ensuing year: President, C. C. Pervier, Sheffield; secretary, Guy A. Bryant, Princeton; treasurer, G. C. Kellogg, Tiskilwa.

Calhoun County—Institute held at Hardin Nov. 12 and 13, 1901; cost, $51.35; average daily attendance, 200. Officers elected for the ensuing year: President, Geo. W. Long, Hillcrest; secretary, Chas. Temple, Hardin; treasurer, Geo. L. Aderton, Hardin.

Carroll County—Institute held at Shannon Jan. 28 and 29, 1902; cost, $108.61; average daily attendance, 250. Officers elected for the ensuing year: President, D. C. Busell. Milledgeville; secretary, D. H. Zuck, Mt. Carroll; treasurer, John Simpson, Mt. Carroll.

Cass County—Institute held at Virginia Oct. 15 and 16, 1901; cost, $87.65; average daily attendance, 75. Officers elected for the ensuing year: President John Virgin, Virginia; secretary and treasurer, John G. Pratt, Virginia.

Champaign County—Held two institutes: One at the University of Illinois with the Thirteenth Congressional district meeting Jan. 7, 8 and 9, 1902; cost, $78 35; average daily attendance not reported. The other at Mahomet Feb. 13 and 14, 1902; cost, $72.48; average attendance not reported. Officers elected for the ensuing year: President, I. S. Raymond, Philo; secretary, J. A. Hossack, Savoy; treasurer, Z. R. Genung, Rantoul.

Christian County—Institute held at Stonington Oct. 23, 24 and 25, 1901; cost, $75.00; average daily attendance, 600. Officers elected for the ensuing year: President, R. J. Stone, Stonington; secretary, C. D. Simpson, Palmer; treasurer, E. A. Vandeveer, Taylorville.

Forty-acre apple orchard, 11 years old, the property of Hugh Miller, Clay City, Clay Co., Ill. 1900 living trees. Photo taken April 27, 1908.

Clay County—Institute held at Marshall Dec. 4, 5 and 6, 1901; cost, $49.36; average daily attendance, 300. Officers elected for the ensuing year: President, J. J. Meehling, Marshall; secretary, Robert English, Marshall; treasurer, G. W. Tobias, Marshall.

Clay County—Institute held at Flora Oct. 21, 22 and 23, 1901; cost, $69.68; average daily attendance, 100. Officers elected for the ensuing year: President, Israel Mills, Clay City; secretary and treasurer, Chas. D. Duff, Clay City.

Clinton County—Institute held at Trenton Nov. 1 and 2, 1901; cost, $72 80; average daily attendance, 100. Officers elected for the ensuing year: President, J. C. Eisenmayer, Trenton; secretary, John Beckemeyer, Buxton; treasurer, Joseph Heinmann, Albers.

Coles County—Institute held at Charleston Dec. 10, 11 and 12, 1901; cost, $85.67; average daily attendance, 150. Officers elected for the ensuing year: President, Geo. M. Glassco, Charleston; secretary and treasurer, H. F. Hill, Charleston.

Cook County—Institute held at Chicago Heights Jan. 31 and Feb. 1, 1902; cost, $73.99; average daily attendance, 120. Officers elected for the ensuing year: President, C. P. Reynolds, Chicago; secretary, F. C. Rossiter, 91 Washington street, Chicago; treasurer, W. M. Manley, Chicago.

Crawford County—Institute held at Robinson Dec. 3 and 4, 1901; cost, $64.02; average daily attendance, 200. Officers elected for the ensuing year: President, J. M. Hollingsworth, Trimble; secretary, S. S. Reinoehl, New Hebron; treasurer, Alex Delzell, Robinson.

Cumberland County—Institute held at Neoga Dec. 17 and 18, 1901; cost, $61.75; average daily attendance, 75. Officers elected for the ensuing year: President, P. G. Bowman, Greenup; secretary ane treasurer, A. H. Ganaway, Toledo.

DeKalb County—Institute held at Hinckley Dec. 26, 27 and 28; cost, $165.20; average daily attendance, 450. Officers elected for the ensuing year: President, Ernest Willmarth, Sycamore; secretary and treasurer, B. F. Wyman, Sycamore.

DeWitt County—Institute held at Clinton Jan. 21, 22 and 23, 1902; cost, $166.22; average daily attendance, —. Officers elected for the ensuing year: President, P. E. Newell, Clinton; secretary, B. C. Sprague, Clinton; treasurer, H. C. Cline, Clinton.

Douglas County—Institute held at Arcola Dec. 20 and 21, 1901; cost, $100.18; average daily attendance, 200. Officers elected for the ensuing year: President, Joseph Coombe, Arcola; secretary, Claude Gamble, Arcola; treasurer, John Burkey, Arcola.

DuPage County—Institute held at Wheaton Feb. 12, 13 and 14, 1902; cost, $310.00; average daily attendance, 600. Officers elected for the ensuing year: President, C. D. Bartlett, Bartlett; secretary, R. T. Morgan, Wheaton; treasurer, James W. McKee, Eola.

Edgar County—Institute held at Paris Jan. 16 and 17, 1902; cost, $75.99; average daily attendance, 300. Officers elected for the ensuing year: President, C. W. Curl, Paris; secretary, Geo. H. Gordon, Paris; treasurer, C. D. Smith, Grandview.

Edwards County—Institute held at Albion, November 7, 8 and 9; cost, $76.00; average daily attendance, 200. Officers elected for the ensuing year: President, Loren Jack, Albion; secretary, M. E. Shurtleff, Bone Gap; treasurer, Ansel Gould, Bone Gap.

Effingham County—Institute held with the 19th Congressional district meeting at Effingham, Jan. 21, 22 and 23, 1902; cost, $145.35; average daily attendance, 400. Officers elected for the ensuing year: President, Peter Beever, Effingham; secretary and treasurer, Claudius Mitchell, Effingham.

Fayette County—Institute held at Vandalia, Jan. 15 and 16, 1902; cost, $58.48; average daily attendance, 100. Officers elected for the ensuing year: President, Chas. E. Cox, Vandalia; Secretary, Richard Whittle, Vandalia; Treasurer, R. T. Higgins, Vandalia.

Ford County—Institute held at Melvin, Jan. 22, 23 and 24, 1902; cost, $133.82; average daily attendance, 500. Officers elected for the ensuing year: President, J. P. Smith, Roberts; secretary, R. B. Chambers, Roberts; Treasurer, D. A. Taylor, Gibson.

Franklin County—Institute held at Benton, Sept. 23, 24 and 25, 1901; cost, $81.00; average daily attendance, 50. Officers elected for the ensuing year: President, J. M. Vancil, Benton; secretary, George Hickman, Benton; treasurer, C. Moore, Benton.

Fulton County—Institute held at Ipava, Nov. 7 and 8, 1901; cost, 129.72; average daily attendance, 350. Officers elected for the ensuing year: President, B. C. Stoops, Ipava; Secretary, E. H. Diehl, Ipava; treasurer, Geo. W. Shawver, Lewistown.

Gallatin County—Institute held at Equality, Dec. 5 and 6, 1901; cost, $81.00; average daily attendance, 125. Officers elected for the ensuing year: President, James B. Hale, Cottonwood; secretary, Henry Hewitt, Junction; treasurer, William A. Peeples, Shawneetown.

Greene County—Institute held at Roodhouse, Dec. 10 and 11, 1901; cost, $75.00; average daily attendance, —. Officers elected for the ensuing year: President, Geo. B. Metcalf, Greenfield; secretary, Arthur J. Edwards, Greenfield; treasurer, John T. Callaway, Greenfield.

Grundy County—Institute held with the 8th Congressional district meeting at Morris, February 6, 7 and 8, 1902: cost, $146.37; average daily attendance, 200. Officers elected for the ensuing year: President, Wilis A. Clark, Carbon Hill; secretary, Walter A. Rose, Mazon; treasurer, William Reardon, Morris.

Hamilton County—Institutes are held quarterly in Hamilton county; the fall meeting was at McLeansboro, October 15 and 16, 1901; cost, $77.65; avearge daily attendance, 200. Officers elected for the ensuing year: President, John P. Stelle, Dahlgren; secretary, O. M. Foltz, McLeansboro; treasurer, C. H. Kornmeyer, McLeansboro.

Hancock County—Two institutes were held in Hancock County: One at Carthage, Oct. 16 and 17, 1901; cost, $19.00; average daily attendance, 100: The other at Adrian, Jan. 9 and 10, 1902; cost, $25.56; average daily attendance, 400. Officers elected for the ensuing year: President, W. B. Marvel, Carthage; secretary, D. W. Hubbard, Adrain; treasurer, C. N. Dennis, Hamilton.

Hardin County—Institute held at Karbers Ridge Dec. 3 and 4, 1901; cost, $53.75; average daily attendance, 250. Officers elected for the ensuing year: President, M. L. Tyer, Cave in Rock; secretary and treasurer, Ed Schneider, Saline Mines.

Henderson County—Institute held at Stronghurst Oct. 25 and 26, 1901; cost, $71.55; average daily attendance, 250. Officers elected for the ensuing year: President, George T. Pearce, Biggsville; secretary, C. W. McMillan, South Henderson; treasurer, Carl Beal, Reed.

Henry County—Institute held at Cambridge Dec. 5 and 6, 1901; cost, $96.21; average daily attendance, 650. Officers elected for the ensuing year: President, John Miller, Galva; secretary, William Beal, Galva; treasurer, I. B. Hanlon, Nekoma.

Iroquois County—Institute held at Watseka Jan. 15 and 16, 1902; cost, $172.90; average daily attendance, 500. Officers elected for the ensuing year: President, David Broomback, Danforth; secretary J. O. Reeder, Watseka; treasurer, H. C. Center, Watseka.

Jackson County—Institute held at Carbondale Nov. 15 and 16, 1901; cost, $75; average daily attendance, 200. Officers elected for the ensuing year: President, James England, Carbondale; secretary Ed H. Allen, Carbondale; treasurer, Ed Worthen, Murphysboro.

Jasper County—Institute held at Newton Dec. 19 and 20, 1901; cost, $74.50; average daily attendance, 150. Officers elected for the ensuing year: President, W. H. Kibler, Newton; secretary and treasurer, A. A. Nees, Newton.

Jefferson County—Institute held at Mt. Vernon Nov. 14, 15 and 16, 1901; cost, $77; average daily attendance, 500. Officers elected for the ensuing year: President, S. T. Maxey, Mt. Vernon; secretary and treasurer, T. J. Holstlaw, Mt. Vernon.

Jersey County—Institute held at Jersyville with the Sixteenth district meeting Dec. 17, 18 and 19, 1901; cost, $140; average daily attendance, 150. Officers elected for the ensuing year: President, C. W. Simmons, Jerseyville; secretary and treasurer, J. W. Becker, Jerseyville.

JoDaviess County—Institute held at Warren with the Ninth district meeting Jan. 16 and 17, 1902; cost, $125.70; average daily attendance, 500. Officers elected for the ensuing year: President, Read Russell, Warren; secretary and treasurer, P. T. Hicks, Warren.

Johnson County—Institute held at New Burnside Nov. 13 and 14, 1901; cost, $75; average daily attendance, 117. Officers elected for the ensuing year: President, W. J. Casper, New Burnside; secretary and treasurer, R. W. Alsbrook, New Burnside.

Kane County—Institute held at Geneva Feb. 25, 26 and 27, 1902; cost, $160.83; average daily attendance, 1,100. Officers elected for the ensuing year: President, Fred Belden, Kaneville; secretary, C. P. Dutton, Geneva; treasurer, Henry McGough, Geneva.

Kankakee County—Institute held at Kankakee with the Twelfth district meeting Feb. 11, 12 and 13, 1902; cost, $124.70; average daily attendance, 85. Officers elected for the ensuing year: President, E. J. Viall, Manteno; secretary and treasurer, L. W. Smith, Manteno.

Kendall County—Institute held at Yorkville, Jan. 21 and 22, 1902; cost, $172.00; average daily attendance, 550. Officers elected for the ensuing year: President, John D. Russell, Oswego; secretary and treasurer, A. C. Gabel, Yorkville.

Knox County—Institute held at Galesburg with the Tenth district meeting, Feb. 4, 5 and 6, 1902; cost, $86.39; average daily attendance, 200. Officers elected for the ensuing year: President, L. W. Olson, Oneida; secretary, Theodore Whitmore, Oneida; treasurer, William McCormack, Oneida.

Lake County—Institute held at Gurnee, Jan. 28, 29 and 30, 1902; cost, $88.95; average daily attendance, 220.

Seventh District—Institute held at Gray's Lake, Feb. 7 and 8, 1902; cost, $71.67; average daily attendance, 100. Officers elected for the ensuing year: President, R. W. Chittenden, Gurnee; secretary, M. F. Clow, Gray's Lake; treasurer, O. B. Whitmore, Gurnee.

LaSalle County—Institute held at Ottawa, January 20 and 21, 1902; cost, $175.77; average daily attendance, 600. Officers elected for the ensuing year: President, D. M. Terry, Earlville; secretary and treasurer, F. M. Higgins, Ottawa.

Lawrence County—Institute held at Lawrenceville, Nov. 21, 22 and 23, 1901; cost, $61.33; average daily attendance, 91. Officers elected for the ensuing year: President, W. E. Neal, Bridgeport; secretary and treasurer, Pobert Kingsbury, Pinkstaff.

Lee County—Institute held at Pawpaw, Jan. 28 and 29, 1902; cost, $75.61; average daily attendance, 300. Officers elected for the ensuing year: President, J. L. Hartwell, Dixon; secretary, I. F. Edwards, Dixon; treasurer, Collons Dysart, Nachusa.

Livingston County—Institute held at Pontiac, Jan. 15 and 16, 1902; cost, $88.90; average daily attendance, 650. Officers elected for the ensuing year: President, D. Brewer, Fairbury; secretary, H. B. Taylor, Fairbury; treasurer, John W. McDowell, Fairbury.

Logan County—Institute held at Lincoln with the Seventeenth district meeting, Dec. 18, 19 and 20, 1902; cost, $125.35; average daily attendance, 300. Officers elected for the ensuing year: President, J. T. Foster, Elkhart; secretary, J. W. Jones, Lincoln; treasurer, John Zeter, Lincoln.

McDonough County—Institute held at Bushnell with the Fifteenth district meeting, Nov. 13, 14 and 15, 1901; cost, $86 90; average daily attendance, 150. Officers elected for the ensuing year: President, Fred G. Miner, Adair; secretary, C. L. Merriam, Macomb; treasnrer, H. A. Knight, Macomb.

McHenry County—Held two meetings, one at Nunda and one at Hebron, Jan. 21, 22, 23 and 24, 1902; cost of the two, $343.27; average daily attendance, 450. Officers elected for the ensuing year: President, H. T. Thompson, Marengo; secretary, J. H. Turner, Hebron; treasurer, F. C. Wells, Harvard.

McLean County—Institute held at Bloomington, Jan. 7 8 and 9, 1902; cost, $538 85; average daily attendance, 1,000. Officers elected for the ensuing year: President, John M. Anthony, Bloomington; secretary, H. S. Seitz, Normal; treasurer, John F. Moore, Bloomington.

Macon County—Institute held in Decatur, January 21 and 22, 1902; cost, $77.95; average daily attendance, 1,000. Officers elected for the ensuing year: President, William H. Bean, Blue Mound; secretary, C. A. Thrift, Forsythe; treasurer, Chas. H. Scott, Mt. Zion.

Macoupin County—Institute held at Carlinville Nov. 20 and 21, 1901; cost, $104.74; average daily attendance, 1,200. Officers elected for the ensuing year: President, Will B. Otwell, Carlinville; secretary, W. H. Stoddard, Carlinville; treasurer, Elsworth Chiles, Carlinville.

Madison County—Institute held at Alhambra Oct. 31 and Nov. 1, 1901; cost, $135.93; average daily attendance, 1,200. Officers elected for the ensuing year: President, A. L. Spies, St. Jacobs; secretary and treasurer, L. S. Dorsey, Moro.

Marion County—Institute held at Salem, with Twenty-first district meeting on Nov. 20, 21 and 22, 1901; cost, $311.20; average daily attendance, 500. Officers elected for the ensuing year: President, A. V. Schermerhorn, Kinmundy; secretary, Fred C. Goodnow, Salem; treasurer, T. S. Marshall, Salem.

Marshall County—Institute held at Varna, with Fourteenth district meeting Dec. 20 and 21, 1901; cost, $121.00; average daily attendance, 200. Officers elected for the ensuing year: President, H. A. Winter, Wenona; secretary and treasurer, A. C. Garvin, Wenona.

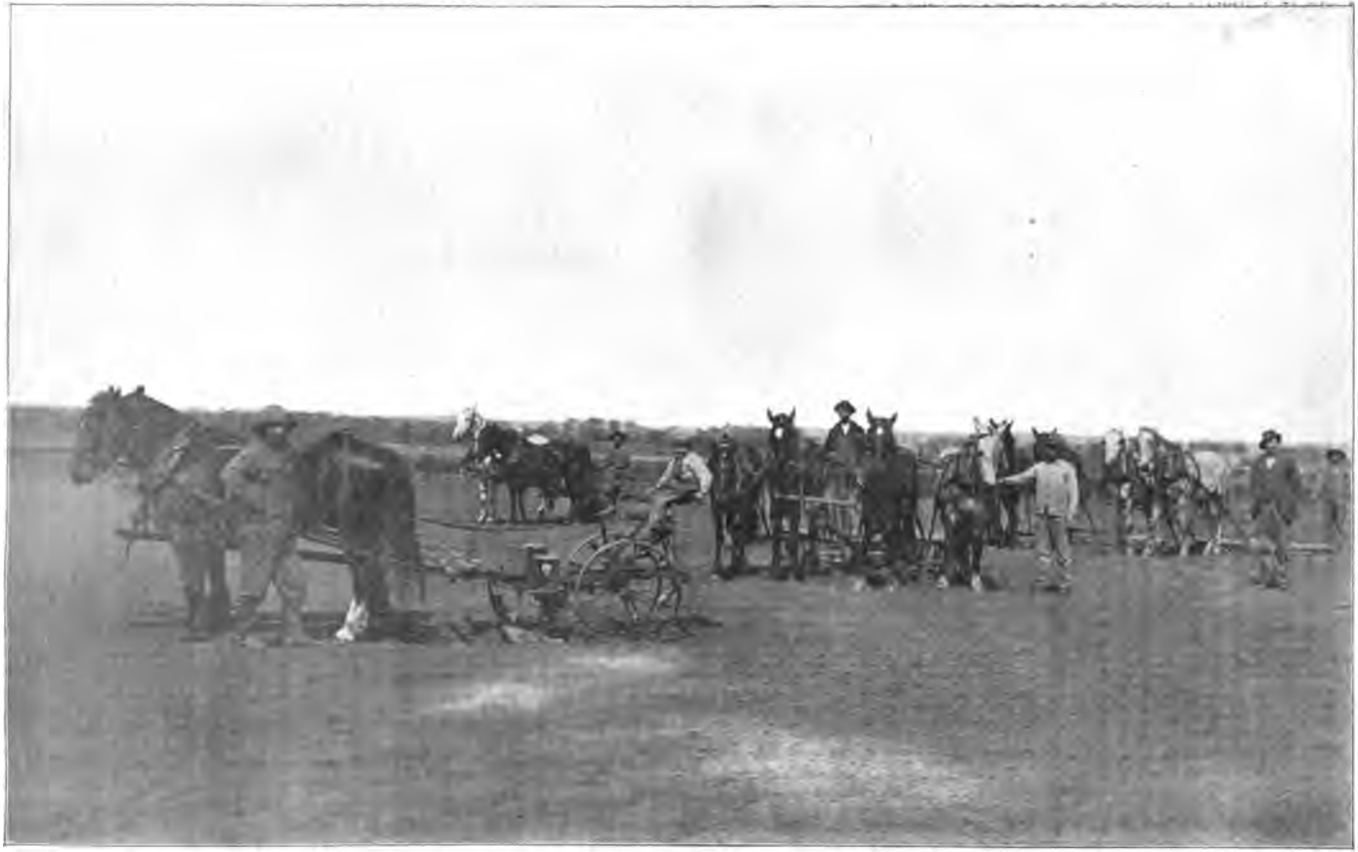
Mason County—Institute held at Mason City Oct. 8 and 9, 1901; cost, $95.45; average daily attendance, 800. Officers elected for the ensuing year: President, I. L. Pottorf, Mason City; secretary, Frederich Hess, Mason City; treasurer, Mrs. Lenna Peine, Mason City.

Massac City—Institute held at Metropolis, with Twenty-second district meeting Dec. 5, 6 and 7, 1901; cost, $123.35; average daily attendance, 200. Officers elected for the ensuing year: President, Andrew Davisson, Metropolis; secretary, Doric Slimpert, Metropolis; Treasurer, J. F. McCartney, Metropolis.

Menard County—Institute held at Petersburg Jan. 14 and 15, 1902; cost, $82.85; average daily attendance, 600. Officers elected for the ensuing year: President, J. W. Hellstern, Atterbery; secretary and treasurer, W. D. Masters, Petersburg.

Mercer County—Institute held at New Windsor, Dec. 10 and 11, 1901; cost, $100.49; average daily attendance, 150. Officers elected for the ensuing year: President, George Thornton, Millersburg; secretary, Alva Jay, Sunbean; treasurer, Paul Ketzle, Hamlet.

Monroe County—Institute held at Waterloo; Nov. 12 and 13, 1901; cost, $82.09; average daily attendance, 250. Officers elected for the ensuing year: President, Balzer Schmidt, Watarloo; secretary, Wm. J. Harm, Kidd; treasurer, Wm. Limestall, Renault.



Preparing and planting a field of "Pride of the North" corn at Oak Grove Farm, Hebron, McHenry county, Ill.

A typical McHenry county, Illinois, dairy farm, the property of

Montgomery County—Institute held at Raymond, Oct. 22, 23 and 24, 1901; cost, $139.71; average daily attendance. 2.500. Officers elected for the ensuing year: President, Arthur Ware, Butler; secretary, E. C. Richards, Hillsboro; treasurer, Edward Grimes, Raymond.

Morgan County—Institute held at Jacksonville, Oct. 16, 17 and 18, 1901; cost, $83.55; average daily attendance, 200. Officers elected for the ensuing year: President, Marcum A. Hulett, Arnold; secretary, Charles A. Rowe, Jacksonville; treasurer, E. D. Scott, Franklin.

Moultrie County—Institute held at sullivan, with Eighteenth district meeting Dec. 11, 12 and 13, 1901; cost, $124.85; average daily attendance, 104. Officers elected for the ensuing year: President, W. L. Rhodes, Bethany; secretary, Isaac M. Woodruff, Bethany; treasurer, D. C. Frantz, Sullivan.

Ogle County—Institute held at Mt. Morris Jan. 30 and 31, 1902; cost, $120.03; average daily attendance, 600. Officers elected for the ensuing year: President, D. D. Emery, Byron; secretary and treasurer, Frank Lynn, Byron.

Peoria County—Institute held at Elmwood Jan. 28 and 29, 1902; cost, $75.00; average daily attendance, —. Officers elected for the ensuing year: President, Ira Cottingham, Eden; secretary and treasurer, William West, Hanna City.

Perry County—Institute held at Pinckneyville Nov. 14 and 15, 1901; cost, $80.91; average daily attendance, 200. Officers elected for the ensuing year: President, John B. Pier, Cutler; secretary and treasurer, W. T. White, Cutler.

Piatt County—Institute held at Monticello Jan. 30 and 31, 1902; cost, $76.60; average daily attendance, 400. Officers elected for the ensuing year: President, W. M. DeWees, DeLand; secretary, F. A. Odernheimer, Monticello; treasurer, C. Y. Bear, Monticello.

Pike County—Institute held at Griggsville Dec. 13 and 14, 1901; cost, $78.69: average daily attendance, 150. Officers elected for the ensuing year: President, Hardin Westlake, Pittsfield; secretary, W. R. Wilsey, Pittsfield; treasurer, Samuel Morgan, Pittsfield.

Pope County—Institute held at Golconda Nov. 8 and 9, 1901; cost, $50.79; average daily attendance, 100. Officers elected for the ensuing year: President, F. L. Sutherland, Golconda; secretary, A. H. Floyd, Golconda; treasurer, Joe M. Baker, Golconda.

Pulaski County—Institute held at Villa Ridge Oct. 30 and 31, 1901; cost, $70.00; average daily attendance, 150. Officers elected for the ensuing year: President, W. H. Leidigh, Villa Ridge; secretary, Robert Endicott, Villa Ridge; treasurer, H. M. Hogendobler, Villa Ridge.

Putnam County—Institute held at Granville Dec. 19 and 20, 1901; cost, $68 20; average daily attendance, 125. Officers elected for the ensuing year: President, A. J. Robinson, Granville; secretary and treasurer, George N. Hayslip, Granville.

Randolph County—Institute held at Sparta Nov. 13 and 14, 1901; cost, $75 00; average daily attendance, —. Officers elected for the ensuing year: President, S. S. Taylor, Sparta; secretary, William Preston, Sparta; treasurer, W. C. Patton, Sparta.

Richland County—Institute held at Olney Nov. 20 and 21, 1901; cost, $77.15; average daily attendance, 450. Officers elected for the ensuing year: President, Ed. Philips, Olney; secretary and treasurer, Frank Britton, Olney.

Saline County—Institute held at Eldorado Dec. 4 and 5, 1901; cost, $61.93; average daily attendance, 250. Officers elected for the ensuing year: President, Hezekiah Bramlet, Eldorado; secretary' H. S. Anderson, Harrisburg; treasurer, C. H. Burnett, Eldorado.

Sangamon County—Institute held at Pleasant Plains Oct. 15 and 16, 1901; cost, $70.00; average daily attendance, 240. Officers elected for the ensuing year; President, Ira Knight, Williamsville; secretary, James A. Stone, Springfield, R. F. D.; treasurer, L. H. Coleman, Springfield.

Schuyler County—Institute held at Rushville Oct. 10 and 11, 1901; cost, $72.23; average daily attendance, 450. Officers elected for the ensuing year: President, C. M. Doyle, Rushville; secretary, J. H. Boice, Rushville; treasurer, J. W. Whitson, Rushville.

Scott County—Institute held at Winchester Dec. 11 and 12, 1901; cost, $79.40; average daily attendance, 200 Officers elected for the ensuing year: President, M. R. Smithson, Winchester; secretary, J. T. Priest, Winchester; treasurer, F. F. Clark, Manchester.

Shelby County—Held two institutes: One at Stewardson Oct. 30 and 31, 1901; cost, $38 57; average daily attendance, 150. One at Windsor Feb. 26 and 27, 1902; cost, $36.43; average daily attendance, 100. Officers elected for the ensuing year: President, W. E. Killam, Tower Hill; secretary, S. B. Carr, Shelbyville; treasurer, William Middlesworth, Shelbyville.

St. Clair County—Institute held at Belleville Oct. 31 and Nov. 1, 1901; cost, $96 98; average daily attendance, 150. Officers elected for the ensuing year: President, Geo. Daab, Smithton; secretary, Philip Brandenberger, Smithton; treasurer, L. B. Eidmann, Mascoutah.

Stark County—Institute held at Wyoming Dec. 12 and 13, 1901; cost, $59.98; average daily attendance, —. Officers elected for the ensuing year: President, James H. Hall, Bradford; secretary, Elmer Buffum, LaFayette; treasurer, Irvin Nowlan, Toulon.

Stephenson County—Institute held at Freeport Jan. 15 and 16, 1902; cost, $102.13; average daily attendance, 450. Officers elected for the ensuing year: President, Edwin D. Herbert, Freeport; secretary, H. M. Phillips, Lena; treasurer, Frank B. Walker, Cedarville.

Tazwell County—Institute held at Hopedale Dec. 17, 18 and 19, 1901; cost, $75; average daily attendance, 400. Officers elected for the ensuing year: President, Ralph Allen, Delavan; secretary, H. S. Griesemer, Hopedale; treasurer, John Schrock, Pekin.

Union County—Institute held at Anna Nov. 29 and 30, 1901; cost, $59; average daily attendance, 100. Officers elected for the ensuing year: President, L. J. Hess, Anna; secretary, L. L. Casper, Anna; treasurer, D. W. Karraker, Jonesboro.

Vermilion County—Institute held at Ridge Farm Jan. 22 and 23, 1902; cost, $84.33; average daily attendance, 400. Officers elected for the ensuing year: President, Geo. W. Hobson, Homer; secretary, J. H. Oakwood, Danville; treasurer, M. J. Walford, Danville.

Wabash County—Institute held at Allendale Nov. 4, 5 and 6, 1901; cost, $106; average daily attendance, 250. Officers elected for the ensuing year· President, S. S. Seiler, Sugar Creek; secretary John J. Ewald, Bellmont; treasurer, Isaac W. Jaquess, Mt. Carmel.

Warren County—Institute held at Roseville Jan. 23 and 24, 1902; cost. $75; average daily attendance, 400. Officers elected for the ensuing year: President, E. N. Cobb, Monmouth; secretary, D. C. Frantz, Monmouth; treasurer, Thos. S. McClanahan, Monmouth.

Washington County—Institute held at Nashville Nov. 19 and 20, 1901; cost, $75; average daily attendance, 500. Officers elected for the ensuing year: President, J. O. Chenney, Plumhill; secretary, J. S. Randall, Nashville; treasurer. E. P. Seibert, Ashley.

Wayne County—Institute held at Jeffersonville Oct. 24, 25 and 26, 1901; cost, $75 00; average daily attendance, 600. Officers elected for the ensuing year: President, E. A. Rankin, Fairfield; secretary and treasurer, G. T. Beck, Jeffersonville.

White County—Institute held at Carmi, with the Twentieth district meeting, Oct. 17, 18 and 19, 1901; cost, $125 00; average daily attendance, 300. Officers elected for the ensuing year: President, John W. Wies, Phillipstown; secretary and treasurer, Daniel Berry, Carmi.

Will County—Institute held at Joliet Jan. 16, 17 and 18, 1902; cost, $348.85; average daily attendance, 2,000. Officers elected for the ensuing year: President, E. L. Wilson, Manhattan; secretary and treasurer to be appointed.

Williamson County—Institute held at Marion Oct. 18 and 19, 1901; cost, $75.00; average daily attendance, 100. Officers elected for the ensuing year: President, T. M. Mitchell, Corinth; secretary, Mrs. M. L. Copeland, Marion; treasurer, A. M. Townsend, Marion.

Winnebago County—Institute held at Rockford Jan. 14 and 15, 1902; cost, $96.57; average daily attendance, 550. Officers elected for the ensuing year: President, Clarence Coolidge, Winnebago; secretary, George Tullock, Rockford, F. R. D.; treasurer, Theron Pierpont, Rockford.

Woodford County—Institute held at Washburn Dec. 11 and 12, 1901; cost, $74.01; average daily attendance, 300. Officers elected for the ensuing year: President, P. H. Davison, Benson; secretary, John L. McGuire, Metamora; treasurer, F. H. Kauffman, Cruger.

SUMMARY.

Total number of counties holding farmers' institutes during the year, 101.

Total number of institutes held during the year, 109.

Total number in daily attendance, 39,187.

Average daily attendance, 368.

Total cost, $11,757.07.

Average cost per county, $116.40.

APPENDIX

APPENDIX

The Farmers' Institute free libraries have been very much in demand in all sections of the State. Those who have been enterprising enough to make application have received libraries and have been very much benefited by their use. The character and scope of the books in these libraries have given general satisfaction, and so far all the patrons of the several communities have found something to supply their desires. Five or more citizens of any community in need of books can secure the use of one of these libraries free for six months by filing application for same, endorsed by the president and secretary of the county farmers' institute of the county in which the community is located. The use of these books to be free to all who will comply with the rules of the library. The only expense will be the express charges from Springfield and return.

For application blanks and further information address,

A. B. HOSTETTER,
Secretary Illinois Farmers' Institute, Springfield, Ill.

ILLINOIS FARMERS' INSTITUTE FREE LIBRARIES.

The libraries have been distributed and in use over the State in the following counties and places:

County.	Place.	Librarian.	No. of library
Adams	Golden	Thos. B. Garrett	3
	Clayton	Chas. Peacock	14
	Burton	William Enlow	27
	LaPrairie	Robt. C. Henry	44
	Paloma	Rolla L. Riley	76
	Camp Point	David Cate	1
Alexander	McClure	Miss Minnie Bunch	37
Bond	Sorento	Ina Martin	11
	Sorento	Leslie Robb	17
	Mulberry Grove	M. M. Davis	45
Boone	Belvidere	Mrs. Clark Russell	15
	Belvidere	Miss Leonice Walker	61
Brown	Mt. Sterling	Mrs. Martha Golden	18
Bureau	Tiskilwa	Mrs. Grace Sisler	1
Carroll	Mt. Carroll	Miss E. Finlayson	100
	Polsgrove	F. G. Thomas	111
Cass	Virginia	M. J. Alkire	33
Champaign	Savoy	James H. Dunlap	5
	Sidney	George Cole	71
	Foosland	Roy H. Jones	1
Christian	Owaneco	L. L. Etter	20
	Blue Mound	Benj. Bullington	20
	Morrisonville	Mrs. Louis Rittger	26
	Illiopolis	M. W. Staples	62
	Buckhart	N. N. Stevenson	91
Clark	Marshall	John A. Sweet	25
Clay	Flora	D. A. McQueen	36
	Flora	Lilian Jenkins	59
Coles	Diona	Isaac Y. Hutton	10
	Charleston	S. A. Dorris	95
Crawford	West York	Mrs. Lucy Ormiston	20
	West York	Mrs. Lucy Ormiston	57
DeKalb	Kingston	Stuart Sherman	34
Douglas	Arcola	Clisbie, Hall & Co	13
	Arcola	John R. Clisbie	31
	Arcola	John R. Clisbie & Co	56
Edgar	Grandview	Jesse S. Harris	21
	Warrenton	S. F. Honnold	6
Effingham	Effingham	Claudius E. Mitchell	103
Fayette	Vandalia	C. F. Easterday	2
	Vandalia	Joe Oldfield	42
	Bayle City	F. M. Pope	82
	Vandalia	T. B. Willms	84
	Brownstown	Miss Bessie Griffith	85
	Ramsey	E. D. Hart	86
	St. Paul	Gust Maske	24
	Loogootee	J. L. Dunbar	13
	Bayle City	Mike Duspiva	37
	Kempton	L. B. Mansel	18
	Sibley	J. Hrdlicka	25

Free Libraries—Continued.

County.	Place	Librarian.	No. of library
Franklin	Benton	Marshall M. Neal	14
	Benton	Marshall M. Neal	41
	Benton	O. C. Smith	61
	Benton	Harley Lewis	89
	Benton	Geo. W. Bennett	63
	Mulkeytown	J. M. Royal	31
	Mulkeytown	S. L. Plumlee	76
Fulton	Vermont	C. L. Armrine	10
	Lewistown	Mrs. J. B. Depler	6
	Breeds	Samuel Zimmerman	30
	Lewistown	Glade F. Love	70
Greene	Greenfield	W. J. Ford	32
[redacted]	Greenfield	W. J. Ford	107
Grundy	Mazon	L. R. Murray	11
[redacted]	Newark	Tobias Peterson	69
Hamilton	McLeansboro	O. J. Davis	20
Hancock	Basco	C. C. Collins	29
	Adrian	William Myers	46
	Niota	Lloyd Bertschi	10
Henderson	Stronghurst	J. Wesley Rankin	43
	Stronghurst	Leta Moore	83
	Oquawka	Hayes Moffitt	90
	Olena	Miss Ida Burrell	92
	Lomax	Chas. Bowen	94
	Reed	Frank Reed	110
	Kirkwood	Edna S. Hogue	9
Henry	Rickel	Julia Papendick	63
	Geneseo	Miss Ida Hoffman	94
Jackson	Carbondale	H. G. Easterly	4
	Murphysboro	H. L. Graff	4
	DuQuoin	I. Elmer Watson	37
	Carbondale	James England	39
	Degognia	Henry Cox	74
	Ava	Miss Nettie McBride	66
	Vergennes	James T. Hood	54
	Vergennes	J. N. Parish	42
Jasper	Lis	Mrs. S. Rose Carr	13
	Oblong	D. W. Francis	66
	Lis	Mrs. S. Rose Carr	84
Jefferson	Mt. Vernon	W. S. Partridge	33
	Mt. Vernon	O. H. Kimmel	58
	Mt. Vernon	J. M. Latta	70
Jersey	Jerseyville	Miss Annie Oertel	9
	Jerseyville	Roy A. Landon	52
Johnson	New Burnside	J. N. Berry	6
	New Burnside	R. W. Alsbrook	10
	Goreville	Roy Grace	19
	Vienna	Miss Edith Burris	80
	New Burnside	Leona Blanchard	97
	Reevesville	Geo. Cummins	15
	Goreville	Hezzie Gold	45
Kankakee	Manteno	P. T. Dole	1
	Waldron	Mrs. Geo. L. Brown	34
Lake	Milburn	Annie McCredie	32
	Gurnee	Vivien L. Bonner	67
LaSalle	Tonica	W. F. Pringle	29
	Tonica	M. F. Pringle	49
	Marseilles	D. A. Nickolson	51
	Tonica	Ira D. Pringle	52
	Grand Ridge	Erwin L. Martin	98
	Lowell	Joseph W. Waterbury	104
Lawrence	Lawrenceville	Stephen Patton	26
	Island	William J. Applegate	47
Lee	Ashton	Smith Brothers	5
	Harmon	Miss Frances Lyons	13
	Dixon	Miss Minnie E. Decker	45
Logan	Emden	J. Val Wiekert	35
	Lincoln	H. P. Purviance	81
Macoupin	Medora	W. J. Chapman	108
Madison	Bethalto	Harry Duffy	4
	Edwardsville	Miss Freda Tegmeier	7
	Peters	H. P. Willoughby	26
	Edwardsville	Miss Alma Vollrath	77

Free Libraries—Continued.

County.	Place.	Librarian.	No. of library
Marion	Salem	J. Storment	12
	Alma	Celia Mills	24
	Kinmundy	A. V. Schmerhorn	40
	Iuka	D. R. Smith	78
	Salem	Laura Hite	109
Marshall	Varna	Mrs. J. C. Shields	27
Mason	San Jose	C. H. Barkmeier	8
	Mason City	Carl Ameling	24
Massac	Metropolis	Miss Kate McCartney	7
	Unionville	Thos. R. Dugger	7
McHenry	Hebron	D. A. Hyde	2
McLean	Ellsworth	E. L. Pancake	12
	Heyworth	O. J. Condon	17
	Ellsworth	John H. Kitch	28
	Bloomington	Ringhouse & Young	49
Mercer	Viola	Collins Sisters	19
Montgomery	Fillmore	W. L. Curry	16
	Fillmore	W. L. Curry	6
	Witt	H. S. Butler	42
	Fillmore	W. L. Curry	50
	Barnett	C. J. Upton	75
Moultrie	Dalton City	J. A. Hilligoss	12
	Bethany	W. L. Hudson	22
	Bethany	W. L. Hudson	65
Ogle	Holcomb	Raymond Gates	67
Peoria	Dunlap	E. W. Zook	2
	Chillicothe	O. A. Roberts	3
	Monica	A. J. Hayes	39
	Eden	H. S. Herriff	60
Perry	Cutler	Miss Lidia Gaston	4
	Tamaroa	J. W. Whitlock	15
	Swanwick	J. C. Elliott	23
	Tamaroa	William Lee	33
	Tamaroa	William Lee	79
	Coulterville	William Walker	98
	Denmark	W. R. Jenkins	8
Pike	New Salem	A. Ray Bowlin	23
Pope	Golconda	John H. Hodge	16
Pulaski	Villa Ridge	Miss Ada Crain	17
	Levings	Miss Alice Hawley	27
Randolph	Sparta	W. D. Eiker	3
Richland	Calhoun	A. H. Byers	29
	Wakefield	Lewis Brown	54
Rock Island	East Moline	J. F. Ege	16
	East Moline	J. F. Ege	48
Sangamon	Bates	Chas. R. Taylor	9
	Round Prairie	Mrs. E. A. Sterling	18
	New Berlin	A. J. Taylor	30
	New Berlin	A. J. Taylor	53
	Curran	Mrs. M. W. Summers	102
	Cantrall	Mrs. Lucinda Brown	50
Scott	Manchester	L. L. Bradley	30
Shelby	Assumption	Mrs. Just Wright	36
St. Clair	Belleville	Mrs. J. F. Miller	65
Saline	Harrisburg	T. O. Hawkins	8
	Eldorado	H. Bramlet	19
Tazewell	Green Valley	Estella Trowbridge	28
	Hopedale	Robt. D. Roloefson	40
Union	Anna	J. H. Apple	101
Vermilion	Rossville	C. A. Miller	5
	Cheneyville	John E. Leach	11
Warren	Kirkwood	Miss Dela Yeomans	9
Wayne	Fairfield	Miss Lizzie Alexander	18
	Fairfield	Miss Dora King	22
	Jeffersonville	Geo. W. Burton	32
White	Epworth	Ernest I. Pomeroy	105
Whiteside	Coleta	Mrs. C. H. Manning	12
	Prophetstown	Vera J. Maxwell	35
	Prophetstown	Eva L. Woodward	58
	Morrison	Mrs. S. A. Maxwell	69
	Denrock	Augusta Fuller	87
	Prophetstown	Mrs. G. G. Thompson	17

Free Libraries—Concluded.

County.	Place.	Librarian.	No. of library
Williamson	**Marion**	**W. R. Norman**	**8**
	Absher	**Geo. Neely**	**6**
	Creal Springs	**Hubert Atwood**	**31**
	Carterville	**Miss Myrtle Long**	**34**
	Corinth	**John Stewart**	**64**
	Carterville	**G. R. Brewer**	**68**
	Blairsville	**W. G. Ferges**	**72**
	Gelatia	**Miss Stella King**	**73**
	Lake Creek	**N. F. Atwood**	**88**
	Blairsville	**M. F. Emmerson**	**96**
	Carterville	**Lorenso Swan**	**99**
	Carterville	**Lilian Armstrong**	**106**
Winnebago	**Rockton**	**Mrs. Robt. Beamish**	**38**
	Rockton	**D. E. Powell**	**38**
Woodford	**Secor**	**William Ludwick**	**14**
	Metamora	**James Frantz**	**15**

Total number of places where libraries have been for six months or over, 210; total number of counties using them, 74.

Communities without a library desiring one of the Farmers' Institute free libraries should address the secretary,

A. B. HOSTETTER,
Springfield, Ill.

THE WORK OF THE COLLEGE OF AGRICULTURE.

It is not easy to give in brief space an idea of the work done at the college of agriculture.

No less than 82 distinct lines of work are offered, viz: Eighteen in agronomy, 18 in animal husbandry, 13 in dairy husbandry, 19 in horticulture, nine in household science, three in veterinary science, and two in thermatology.

This means that 82 separate classes are organized and conducted, providing, of course, every subject offered is elected by somebody. No such list of studies is offered in any other college of agriculture. It is not expected that any one student will take all these courses, which would require years of his time, and many would be of no use to him. By this it is meant that many of these courses are exceedingly technical and if a student elects the more technical lines of horticulture, for example, he will certainly never need the more technical work in dairy husbandry. From this it will be understood that these offerings are not made with a view of teaching the rudiments only, as a part of a general course, but that the more difficult and unusual questions are outlined and taught for the benefit of specialists. This is what requires large numbers of instructors, and those of the highest attainable excellence, because any others would fail in teaching more than the more elementary subjects. This technical work is supplemented by the best scientific and literary instruction the university is able to offer. The student is expected to take one-half his work in technical agriculture, the other half to be divided between the sciences, languages and other university studies, partly as he may elect and partly according to the requirements of the college. Any given student with us may choose without restriction two full years' work in agriculture, and two years' work in anything taught in the university. Everything else will be modified more or less by requirements as to what shall constitute a proper college course. Many of these subjects are elementary, and may be taken by any student of fair maturity and preparation. Others are exceedingly technical and can be undertaken only after the best of preparation at the university. Special students are, therefore, permitted to take, without examination, if they so desire, whatever studies they are able to follow, and may avail themselves of this privilege, perfecting their preparation as they go along.

This technical work in agriculture is given by 20 instructors, each teaching a narrow line and no other. This is by far the largest number of instructors in agriculture in any similar institution, and when it is considered that each of these classes is taught by a specialist the value of the instruction must be evident. This was the first institution to abolish the title Professor of Agriculture and establish titles representing subdivisions of the work, and it is also the first institution to do the same for horticulture.

WHAT IS TAUGHT.

Agronomy—In this department six instructors conduct classes in 18 different subjects, covering such important lines of work as location, leveling, digging, laying and care of drains, their cost and efficiency based upon the necessary size. Field machinery from the plow to the binder, including special instructions for machinery experts, farm power machinery, feed cutters, corn shellers, etc.; farm buildings, fences and roads; their construction and cost.

The quality and improvement of farm crops. Judging of corn, oats and wheat with methods of breeding, conditions of germination and growth of farm seeds; preservation of seeds to secure the highest fertility; fungous diseases of crops; weeds and their eradication; special studies of particular crops with practical work in the field; field experiments for advanced students; testing varieties of corn, wheat and oats; method of planting; treatment of oats and wheat for smut, etc.

Soil physics, consisting of the management of soil to secure their best physical condition through plowing, cultivation, etc.; the relation of the physical condition of soils to moisture; special problems in soil physics in which students conduct independent investigation regarding the effect of farming operations upon soil, moisture and temperature. The study of bacteria of soils and their effect upon the growth of crops and upon fertility; the effect of crops upon the fertility of land; the fertilizers needed for different crops and the rotations that are most economical of fertility and effective in securing a yield; the investigation of special soils, particularly of Illinois.

History of agriculture from the earliest times to the present, showing the development that has taken place. Comparative agriculture, or the reasons for the different agricultural practices in different parts of the world and in different portions of the State.

Seminary course, including a free discussion of the periodical agricultural literature; and last of all the opportunity to conduct original investigation and prepare a thesis for graduation upon almost any of the lines mentioned.

Animal Husbandry—Three instructors give instruction in the different classes of farm animals and their products, including wool, and mutton sheep; the quality and cost of mutton cuts; different grades of wool and their uses in manufactures; the various breeds of sheep and their development. Types and breeds of swine; methods of growing and marketing. Heavy horses; their market classes; best methods of producing and feeding for market. Light horses of different classes and types and the breeds and methods most suitable for their production. The principles of stock feeding, both economical, physical and physiological. The various cuts of beef, mutton and pork; their comparative quality, value and cost; by products of the slaughter house. Market types of beef cattle, including prime steers, stockers and feeders; the breeds of beef cattle; their history development and characteristics, intended for advanced students; methods and principles most successful to beef production in Illinois and other countries and the competition likely to be met by Illinois beef; management of pure bred herds of beef cattle; their most successful maintenance and preparation for the show yard and sale ring, also intended for advanced students.

Stable management and care of horses, both at labor and at rest; the education and driving of the horse, including his training for skillful labor; rules and practices of correct driving; the breeds of light horses, their history and development; breeds of draft horses and their characteristics; selection of breeding stock, and their care and management; last of all the opportunity to conduct original investigation and preparation of thesis for graduation upon almost any of the lines mentioned.

Dairy Husbandry—Three instructors conduct classes covering nearly every phase of dairying, from the judging of the dairy cow to the last discovered fancied dairy product; the character and composition of normal milk and the methods of standardizing; prevention of contamination of milk; the cow as a factor in the economic production of milk; judging cows; the management of a dairy farm and maintanance of the herd, its proper housing, feed and care; various methods for separation of cream as to rapidy and efficiency; different methods of ripening cream and the manufacture of butter and of all sorts of cheese from Cheddar to fancy; management of factories, both on the coöperative and company plan—comparative plans, construction and equipment; proper method of conducting milk supply for cities and villages; dairy practices and methods of other countries; influence of bacteria upon dairy products, their deleterious effect upon the one hand and their value upon the other as contributing flavor; fancy dairy products, and here again the opportunity for original investigation and thesis work.

Horticulture—Four instructors are engaged in this work, teaching the general principles of fruit growing, including cultivation, pruning, spraying and marketing; special study of small fruits; kitchen and market gardening; construction and management of plant houses; principles of plant propagation, as grafting, budding, pollination, etc.; nursery management; theory and practice of spraying plants; a most exhaustive study of orchard fruits and orchard management; a thorough study of forest trees; ornamental and landscape gardening with reference to beautifying homes; evolution of cultivated plants, showing how they have arisen from wild plants; special culture of the grape and of the various kinds of nuts; amateur and commercial floriculture—an advanced course for professional gardeners, largely experimental, with the opportunity to conduct original investigation and prepare thesis for graduation.

Household Science—Two instructors. Selection and preparation of food and influence of heat, cold or fermentation; home architecture and sanitation; heating, lighting, ventilation and drainage of the house; home decoration; an advance course upon the chemistry of food and its nutrition, dealing with dietaries of different ages and occupations; relation of food to health; household management, especially as involves care of the house and its appointments; economic questions in food selection; textiles, their preparation, adulteration, and manufacture.

Thremmatology—The principles and practices of the breeding of domestic animals and plants; a thorough course upon variation, selection, and heredity; methods found most successful in the improvement of animals and plants, together with opportunity for original investigation and thesis work.

Veterinary Science—One instructor gives three courses a year in this subject, running throughout the year, viz.: Anatomy and physiology of domestic animals; the diseases to which they are subject, and the materials employed in their treatment.

No statement on paper can give an idea of the scope and thoroughness of these courses, nor of the opportunities the student may enjoy in making definite selection as to what subjects he wants to pursue. In most institutions he must take much that he does not care for in order to get the little that he needs. Here the division of subjects is so minute that he may by proper selection put his time on those subjects of most consequence to him. This is a day, not of generalities, but of specialization; and if the student is to succeed he must know, not a little about everything, but everything about a little; this is the theory upon which these courses are conducted. The question is often asked whether the University would graduate a man from the college of agriculture without taking all the work offered in agriculture. The reply is, most certainly; life is too short and time too precious to be spent in trying to learn everything. If the student is to be a stockman he can not know the intricacies of horticulture and floriculture. If he is to be a dairyman he does not need to know all that is to be known about horses. It would be very nice if we all knew Greek and Sanscrit; it would be better for us all if our knowledge were both broadened and deepened, but there is no question that that man is most successful and is of the most use to the world who knows whatever he knows thoroughly well. The stock of human knowledge in the world now is too great to be mastered by a single man. The individual must make his choice. An institution should teach everything which the people need to know, and here rests the difference between the individual and the institution in the matter of courses of study.

Much depends upon the method of instruction. In the Illinois College of Agriculture not much lecturing is done. The student is made to do the work himself at first hand. While this method does not fit the students to make a show, it is believed that it is better for them from the fact that it teaches methods of independent study. To train the student to careful methods of work and the drawing of correct conclusions, where to get his information and how to use it, is the policy of this college.

ROLL OF HONOR.

The following is a list of those who attended the college of agriculture of the University of Illinois in the past year on scholarships awarded through the Illinois Farmers' Institute for the two years beginning September, 1901. For particulars in regard to scholarships address the institute director of your congressional district or A. B. Hostetter, secretary, Springfield, Ill.

County Represented.	Name of Student.	Address.
Bond	A. A. Burkhardt	Sorento
Brown	D. Mobley	Mt. Sterling
Brown	D. E. Webb	Mound
Bureau	J. H. White	Princeton
Bureau	J. B. McKee	Sheffield
Champaign	J. W. Adair	Tolono
Champaign	R. E. Chambers	Sedorus
Champaign	T. Hardin	Homer
Champaign	W. Z. Henness	Champaign
Champaign	E. T. McHarry	Tolono
Champaign	W. H. Wisegarver	Savoy
Christian	Roy A. Corzine	Stonington
Christian	H. E. Garwood	Stonington
Christian	F. S. Garwood	Stonington
Christian	W. N. Snyder	Moweaqua
Clay	T. A. Brissender	Flora
Cook, 5th dist	G. R. Blakeslee	Chicago
Cook, 7th dist	Charles R. Scudder	Chicago
Crawford	J. E. Apple	Robinson
Douglas	W. F. McCarty	Tuscola
Douglas	C. W. Roberts	Arcola
Edgar	G. A. Gillespie	Paris
Effingham	J. C. Skittler	Montrose
Ford	I S. Alford	Sibley
Ford	F. G. Musgrove	Vermont
Fulton	A. F. Kidder	Farmington
Fulton	F. Baldwin	Ipava
Fulton	R. Bartholomew	Vermont
Fulton	K. Cattron	Fairview
Fulton	C. E. Record	Farmington
Hancock	S. M. Massie	Colusa
Henry	H. O. Allison	Alpha
Henry	T. W. Greep	Galva
Iroquois	C. J. Mann	Gilman
Iroquois	C. J. Rothgeb	Milford
Johnson	H. F. Wright	Vienna
Kane	T. J. Gilkerson	Hampshire
Kankakee	E. A. Porter	Momence
Knox	J. L. McKeighan	Yates City
Knox	J. C. Fowler	St. Augustine
Lake	W. E. White	Milburn
Lake	J. G. Bonner	Milburn
Lake	D. H. Minto	Loon Lake
LaSalle	F. F. Funk	Ottawa
LaSalle	R. N. Peddicord	Marsaielles
Lee	E. T. Butler	Amboy
Logan	P. H. Crocker	Springfield
Logan	O. F. Mountjoy	Atlanta
McDonough	J. H. Miner	Adair
McDonough	J. W. Clarke	Sciota
McHenry	C. C. Watson	Woodstock
McHenry	C. H. Ocock	Marengo
McHenry	H. F. Burbank	Woodstock
McHenry	C. W. Everett	Harvard
McHenry	C. A. Ocock	Marengo
McHenry	E. G. Webster	Greenwood
McLean	G. W. Brand	Bloomington

Roll of Honor—Concluded.

County Represented.	Name of Student.	Address.
McLean	F. Basting	Yuton
McLean	B. C. Capen	Bloomington
McLean	L. Foreman	Bloomington
McLean	S. A. Cary	Towanda
McLean	D. P. Douglass	Colfax
McLean	O. V. Douglass	Shirley
McLean	J. F. Funk	Bloomington
McLean	Ora B. Johnston	Bloomington
McLean	W. E. Tenney	Bloomington
Macon	H. H. Camp	Harristown
Macon	H. T. Leonard	Decatur
Macon	E. H. Griswold	Blue Mound
Macoupin	F. E. Swayze	Salem
Mason	M. Lucas	Easton
Menard	J. E. Kincaid	Athens
Morgan	F. R. O'Neal	Arnold
Moultrie	M. Fletcher	Dalton City
Ogle	D. E. Woodin	Polo
Ogle	R. C. Good	Haldane
Ogle	L. D. Leonard	Rochelle
Ogle	F. C. Moore	Polo
Ogle	J. Woodin	Polo
Perry	C. A. Braden	Cutler
Piatt	P. H. Dobson	Cerro Gordo
Pike	L. B. Shaw	Summer Hill
Pike	L. L. Sanderson	Summer Hill
Pope	W. A. Wellman	Golconda
Pulaski	T. Conant	Villa Ridge
Richland	F. O. H. Scherer	Olney
Rock Island	J. C. Frye	Rock Island
Sangamon	G. W. Hayes	Pleasant Plains
Sangamon	F. S. Constant	Springfield
Stark	H. L. Cox	Wyoming
Stephenson	R. F. Dameier	Lenta
Stephenson	R. W. Angle	Dakota
Tazewell	C. E. Darling	Green Valley
Tazewell	G. J. Betzellberger	Delavan
Tazewell	F. Capes	Green Valley
Vermilion	G. W. LeFever	Fithian
Vermilion	W. E. Baker	Danville
Vermilion	E. H. Kinney	Collision
Vermilion	C. A. Michael	Pilot
Vermilion	F. A. Shepherd	Fairmount
Washington	H. O. Hinkley	DuBois
Whiteside	W. E. Thompson	Erie
Will	A. M. McClure	Manhattan
Woodford	C. L. Carrithers	Washburn

Total number of those who used scholarships for the year beginning September, 1901, 104.

PAPERS READ AT COUNTY FARMERS' INSTITUTES.

The papers read at county farmers' institutes, embodied in this report, were selected by the executive committee of the Illinois Farmers' Institute from the lists of papers recommended by the directors from the several congressional districts.

These lists contained carefully prepared, practical, instructive papers, all of them worthy of publication and careful reading. But more of them were recommended than could possibly be published within the limits of this volume.

There were also a large number of equally valuable, instructive and entertaining papers read at the several county farmers' institutes which the directors could not secure.

To select from so many, when all were so excellent, was no easy task. The following papers were accepted by the committee with a view of covering as wide a range of topics as possible. Topics which would be of the most general interest to the farmer and his family and would apply more fully to the State at large.

Cattle feeding barns and sheds on the farm of A. B. Puterbaugh, Milledgeville, Carroll Co., Ill.; $7,000 worth of stock sold from this farm in the past year.

CATTLE DEPARTMENT.

*IMPROVING OUR FARM STOCK.

[Address delivered at State Farmers' Institute meeting, Rockford, Illinois, by Fred H. Rankin, secretary Illinois Live Stock Breeders' Association, Urbana, Ill.]

When I received the invitation from Secretary Hostetter to present a paper upon "Improving Our Farm Stock" I hesitated to accept, for I felt I had no new ideas to present, no dazzling theories to advise; in fact, I feel that the subject is too much for me. Yet while I may not succeed in saying anything new on the subject, I hope by the repetition of oft told truths I may in some measure emphasize their importance and say nothing that may detract from the honor and dignity of animal husbandry.

Every department of human endeavor is pulsating with progressive activity. There is a smaller sphere for the uneducated man of every decade, and a diminishing possibility of success for the man who does not read. The reading man is in the saddle. The thinking man is guiding our national destinies. The twentieth century marks the dawning of a world-wide influence, brought about by active men, reading men and thinking men. It means that our civilization, our laws, our commerce, our agriculture with our humanitarian ideas shall exert a powerful effect on mankind the world over. While we give all honor and veneration to the fathers and pioneers of the nineteenth century, yet we, the present generation, must live and work and prosper under totally different environments, circumstances and conditions.

Happy that man, and thrice blessed he who keeps in touch with nature and can draw inspiration from the prairies, the hills, the valleys; and lives amid nature's smiles and whose spirit is attuned to the music of the meadow lark, the call of the Bob White' the caroling brattle of the poultry tribe, and the lowing of kine and the squeeling of swine. This is a charmed life appreciated fully only by a broad-guaged American stock farmer, whose nature broadens with his generous environment.

The doubter and the pessimest who dwell continually in the days of the past will not measure up to the demands of the successful American farmer in this age, pulsating with commercial and agricultural activity.

Gentlemen—American live stock and our meet products should follow the course of our ships, our armies and our flag.

Let us as American stockmen and citizens of this great commonwealth be prepared to lead, and enter the new century pledged to have the best, sell the best, and keep at the head of the procession in the breeding, feeding and marketing of live stock.

We have the lands, the feed and the brains to work· All we lack is the information well diffused among our stock farmers.

"Development" is one of the greatest words in our language, it ever and always should be, the shibboleth of the farmer, for it promises better things to come.

Competition is very keen, land is high and rental value is advancing. The man who in the future makes a financial success of farming must read, must

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* This paper by Mr. Rankin should have followed his introduction on page 217.

study and must intensify. None but the best can live on the farm. In years past the physician who desired his son to follow in his footsteps sent him to a medical school; the merchant sent his son to a commercial college, the lawyer, who revered Blackstone, sent his boy to a law school, but where did the farmer send his son? Answer, echos—where? The members of the above professions knew that the could not educate their sons properly. Not so the farmers of the past. His bump of self-esteem was larger. But fortunately, conditions are changing; we are fast coming to see that before taking up the chief work of life the farmer boys should be fitted for it and made capable and qualified to successfully meet the demands of their calling. Make them good farmers in the same sense that you would qualify them to be successful doctors, lawyers or bankers. Educate them in their calling. Illinois has made a great stride the last half decade in its provisions and facilities for the education of her farm boys. The College of Agriculture at Urbana is already the pride of our State. The latch string of the college hangs out to every boy and girl. Tuition is free. To every youg man comes the personal question—will you embrace the opportunity to go forward to a higher, a nobler and a better farming?

But I must get back to my text and in my simple way try and tell what I know on the subject.

The fact that one man will make a complete failure in the stock business while another takes the same business, in the same place and under the same circumstances, and makes a complete success, plainly indicates that there is something in men as well as methods. The fact that there is more in the man than in the business is my reason for especially advocating the improvement of the farm boy first. When I hear people talking about scrub stock, I feel like telling them they are making a mistake; they should talk about the scrub owner; he makes the scrub stock.

The signs of the times gleaned from 'the stock' market reports, the great success of stock sales all over the country and the unparalleled inteaest manifested in the great International Live Stock Exposition, clearly indicates that the live stock interests of the country are now entering upon a period of unexampled prosperity and expansion, having for its basis a high degree of improvement in the breeding of our flocks and herds and a substantial, natural and healthy growth.

Let us steadfastly and resolutely cling to the new faith that the greatest need of the agriculture of Illinois is a further improvement and greater development for the livestock interests of this imperial State.

No other interest means quite so much to the State as her livestock, because not only agricultural values but all others are greatly enhanced thereby, and because it is the only practical means of maintaining the fertility of the land.

As a matter of fact the farmer does not grow livestock until he is driven to it. It is becoming thoroughly impressed upon the minds of Illinois farmers that the only practicable way of maintaining the fertility of the land is with livestock. If, then, the farmer must raise stock or sell his land by piecemeal, why not grow improved stock—the best for the purpose, whether in breed or individual merit, that can be obtained? After the farmer has had some experience in growing livestock, he begins to study his animals with a view to their improvement, for as he goes to market with his cattle or sheep he finds there a wonderful difference in the selling price; that while one bunch of steers, for example, may sell at $7.00 per hundred, another bunch, equally fat, may not bring over $5.00. He may at first be disposed to blame the "Big Four," or the administration, but further investigation shows him that the men who buy his stock have no prejudice, but that they are buying simply with a view of securing the kind of stock that will furnish the most dressed beef per hundred weight and the largest cuts that bring the highest price on the market. In short, he finds that whether in cattle, sheep or hogs, the long, deep middle, the broad back, or the thick ham, brings the highest price live weight. It is that steer, for example, with the vigorous appetite and digestion that puts the fat on his broad back, deep loin, and well covered ribs, and interlards his muscles in such a way that the carcass furnishes the largest per cent of cuts that bring the high price.

Let us go into the matter a little more thoroughly. Few farmers realize wherein the difference lies between improved stock and unimproved. It is not altogether in the capacity to furnish fertilizers to the land; it is not in the capacity to make pounds of gain. The unimproved, with equal digestive and assimilative capacity, will make about as many pounds of live gain as the improved steer, and his appetite and digestion are quite likely to be fully equal to the improved. The difference in them is in where the gain is placed. Breeders have been for a 100 years studying how to secure a type of all kinds of livestock used for meat product that will furnish the largest amount of cuts so located that they have little movement when the animal takes its ordinary exercise. These are in the loin and the ribs. It may be surprising, but it is nevertheless true, that a first-class beef animal will not only dress, when equally well fattened, a much higher per cent of beef than the unimproved steer, but that 60 per cent of the value of the carcass lies in the ribs and loins alone, and that this represents less than 30 per cent of the total weight of the dressed carcass; *i. e.*, one-third of the weight of the steer, secured by cuts taken from the back and loins, has a monetary value equivalent to that of the remaining two-thirds of the carcass.

Thus far I have spoken of animals improved in the line of meat production and have taken beef cattle as an illustration. The same principles apply to a greater or less extent in the production of both pork and mutton. The same underlying principles should guide the farmer when his object is not the production of meat, but milk. The improved special purpose dairy cow, and this is the type the farmer should use when dairying is his main or exclusive business, is the one that with a given amount of food produces the greatest number of pounds of butter fat consistent with the health of the animal. In other words, he should aim for the greatest production of that which sells for the most money on the market. The dairyman is fooling away his time and his feed with any cow that produces less than 200 pounds of butter per annum. If he is living up to his privileges as a dairyman, he will not stop short of 300 pounds, which can be obtained, not easily, but can be obtained by using the improved breeds, taking advantage of the work that the breeder has done for him.

In advocating improving our farm stock let us not set up a standard for the farmer that he will not, or can not follow, but rather one of mutual profit to the farmer and breeder.

I say it advisedly, the farmer should not start out at first with the idea of becoming a breeder. He should use improved pure bred sires of the breed that suits his fancy and aim at the grading up of his herd. For the farmer and grower of market stock the key to the situation is the pure bred sire. Start with a herd of native cows and a pure bred sire of a breed suited to your taste and environment, breeding the heifer of each generation in the same way, always selecting a sire of the same breed. Your first crop of calves are half blood; their offspring will be three-fourths; theirs again seven-eights, and the breeding is constantly upwards. It is possible to do with cattle what has already practically been done with hogs—banish the unimproved stock. Five or six crosses of improved stock in either line will develop a herd which for beef and milk production is practically equal to pedigreed stock. Let us hope that the day is not far distant when not only scrub stock but the day of the grade sire will have passed into innoxious desuetude.

Gentlemen, breeding is important, but as a contributing factor to the improvement of farm stock, feeding has something to do with the animal. You can make a scrub out of a well-bred animal if you do not go to the trouble to feed him properly. Yo see an animal fitted for a stock show and admired by every one—all of this has not been done by selection and breeding alone, but by careful feeding of the animals. If you take away all of the good feeding of this animal, you lose all the advantages gained by good breeding.

To illustrate this assertion, take a young man from the animal husbandry class at the College of Agriculture and place him in charge of some animals and he will feed them into condition and raise some good stock, but you take the "Willy Willy" society youth he would starve them on the same conditions, not knowing how to feed. Take away good feeding from well-bred animals and you will make scrubs out of them in a short time.

In answer to the question: "Would you advise the general farmer to breed pure bred stock for market purposes?" In answer to such a question if put point blank and without explanations, and answering for the average Illinois farmer, I would say: No, do not start with pure bred female, but buy pure bred tops as sires and breed up. Remember I am answering that question for the general farmer who is without that peculiar line of experience and education demanded of the successful breeder of pure bred live stock, but if the question were put to me in private by a man who I knew to have the true breeders instinct, I would say yes, for by giving thoroughbred care, he can, if he chooses, develop into a skillful and successful breeder.

I have known men who did not know how to care for high bred stock say: "I do not have much faith in pure bred stock anyway, but I have bought a bunch and will turn them out to hustle with my native stock. I'll see what they will do." Three times out of four such a man will fail.

Now there is always a class of unstable farmers who are continually changing their lines and who never stick to one pursuit long enough to master it; men who are aptly described by the story of the wayward Methodist brother, who always began his experience with, "Bretheren, I've been tryin in my weak way to serve the Lord for nigh onto 20 years—off an' on." Now I suspect we have a good many farmers who have been serving the cause of live stock improvement for many years, "off an' on," but like the wayward brother, more frequently off than on.

With the advance in the price of live stock the tendency and temptation will be to rush pell-mell into stock breeding regardless of quality in obtaining quantity. It seems to work that way and in two or three years the "projikin" farmer—whose ways are as variable as a western wind will be swearing "there ain't no money in live stock."

One trouble with the American farmers is the rush there is in us. We are like a flock of sheep; we chase the bell whether, it don't make any difference if he goes over the precipice, we follow.

As a potent factor in the improvement of farm stock, I believe the breeder of pure bred stock has an important part in that he should give more attention to developing the home market, especially for pure bred males, for the breeder will usually advance the interests of his business by urging the sale of male animals rather than females—because a good prepotent sire sold to a farmer or feeder is almost sure to give a good account of himself and raise the grade of the entire flock or herd he is used in, whereas, when the females leave the herd of the breeder, by a little improper management or unwise crossing they may fail to give a satisfactory account of themselves and become deteriorated, and your buyer thus becomes discouraged in his effort to grade up his stock.

Improvement in live stock means improvement in farm management. Every stockman should keep his place tidied up and neat in appearance at all times; animals should be kept well assorted, as they feed more evenly and thrive better; every farmer and salesman understands the value of uniformity of size and quality in making a first impression on his buyers or visitors. And the first impression given is of as much value to the stock farmer, as it is said to be in making love to a lady.

Farmers of Illinois, the responsibility for the improvement or degeneration of our live stock rests largely upon your shoulders. By a judicious and intelligent manner of breeding and feeding you can improve or make more profitable the animals on your farms, or by haphazard unintelligent, shipshod methods, you can take the best bred and most improved live stock and by rapid strides degenerate it to the level of the scrub. In concluding I would say, let us one and all make the laws of breeding a careful study, giving heed to better methods of management, feeding and selection.

Let those who love the horse above all animals strive to bring this noble animal to an advanced and higher plane of improvement than that upon which he found it. To those who take great interest in cattle let them make the effort of their lives toward the improvement of their favorite breeds. Let those who are making a special study of the sheep of our country and the best metheds of management, remember that there is no vocation more honorable than the advancements of our flocks.

Let those who are making the grandest effort of their lives toward the improvement of swine take courage and go on toward perfection in the good work, emulating the success of such eminent farmers and stockmen as our brother Colonel A. J. Lovejoy of this county—the present honored "sportsman" of this imperial State.

In short let us all move forward in a solid column, as did the Grecian Phalanx of old, toward the general improvement of our farm animals.

Who would go back to the old ways of doing? Who would use the sires of 20 years ago? Who would content to own flocks and herds no better than those of 20 years ago? If their be one among this audience who would be so content, I say to him: Get out of the way; the wheels of progress will grind out the life of your business, even though you be allowed to sit in its ashes and mourn over its remains.

Members of the Illinois Farmers' Institute—You are surrounded with nature's gems and benedictions, with your flocks and herds, your happy homes and vine-covered and rose bedecked abode, you are the typical American home builders—and to you as princess of the continent comes the Illinois Live Stock Breeders' Association with heartiest greetings and the heartfelt wish that continued success attend your every effort.

We thank you for the part you have given us on your program As American stockmen we take a pardonable pride in our valuable live stock holdings and we clasp hands with you and say "God speed," in the producing of a higher quality of live stock. To aid in the progress of mankind is our common purpose, in obtaining a broader education that we may grow mentally bigger and broader and contribute our mite in building brighter, more comfortable and happier American homes. Gentlemen, this charmed life of the broadguaged American is destined to reach even to the islands of the sea, for it has been ordained that our Americanism shall broaden with the years. Let us see to it that we are prepared to share our part in this princely heritage.

THE CHARACTERISTICS OF STOCKERS AND FEEDERS.

[By Herbert W. Mamford, Professor of Animal Husbandry, University of Illinois.]

It is not our intention at this time to discuss the question as to whether it pays best to buy and finish good to choice strong weight stockers or light and common to medium grades. This is a question which depends largely upon local and market conditions. In this matter it is safer to depend upon the intelligent judgment of the feeder than upon any general principle involved.

It is necessary, however, to establish a standard grade of stockers and feeders, which we shall attempt to describe; otherwise we should confuse rather than define. If there is one grade of stockers and feeders that is more uniform than another, it is the good to choice grade that will, under proper management, develop into prime steers. It would seem wise, therefore, to consider the desirable characteristics of stockers and feeders which are to be converted into prime bullocks.

It is a comparatively easy task to name the characteristics of the prime steer, or at least to describe one which will meet the present requirements of the market; not so the stocker or feeder. In the former case we have a finished product. In the latter, we are obliged not only to determine whether the steer in finishing will take on that smoothness of outline, that condition and that quality demanded by the market, but also that the same steer when placed in the feed lot will meet the requirements of the farmer. The farmer carries the steer through the fattening process that he may realize a profit by the enterprise. As a rule he is not particular whether he secures his profit by the increased value of each pound of beef by converting the relatively cheap, raw material in the form of stockers and feeders into high priced prime steers, or whether he has realized that profit by being able to produce gains in live weight without a gain in value per pound. Manifestly it is to the former source of profit that he must look with greatest confidence. It is clear, however, that by overlooking the factor of selecting steers which have the ability to economically convert grain and forage into beef we disregard a possible source of profit and run great risk of sustaining loss in our feeding operations where with proper regard to this factor a substantial profit is possible. To put it in another way, we may say that when put into the feed lot the stocker is expected to gain in live weight; such gain may be made at a great loss, or under favorable conditions at a profit. The ability to make economical gains in flesh and fat is thus shown to be of vital importance.

We may say then that we demand in the good to choice stockers and feeders, first, the ability to finish as prime steers, and second, the ability to make economical gains in flesh and fat. As far as our present knowledge of the matter goes, we look for indications of these tendencies in the form, quality and constitution of stockers and feeders.

1. Form—The general form should be low set, deep, broad and compact, rather than high up, gaunt, narrow and loosely made. Stockers and feeders should be low set on short legs because animals of this conformation are almost invariably good feeders and capable of early maturity. They should be deep, broad and compact, because this conformation indicates good constitution, capacity for growth and of ultimately producing a relatively high percentage of the most valuable cuts. They should possess straight top and underlines which should be nearly parallel, should be low at the flanks, thus forming what we have spoken of above as good depth, for the barrel of stockers and feeders as well as dairy cows should be roomy. An animal which is too paunchy, however, is objectionable to the butcher. The matter of low flanks should, I believe, be emphasized, as it is an almost unfailing sign of good constitution and good feeding quality. It should be borne in mind that in the stocker and feeder, thin in flesh and largely destitute of external or surface fat we are afforded the best opportunity we are ever able to get of determining the covering of natural flesh characteristic of the animal.

Secure as much smoothness of outline as is consistent with low flesh, being especially careful to avoid too great prominence in hips, tailhead and shoulders. Avoid rough, open shoulders, sway backs and large coarse heads with small eyes set in the side of the head. Short, broad heads and short, thick necks indicate strong tendencies toward beef making. A large, prominent and mild eye is to be desired. The mild eye denotes that the animal has a quiet disposition, which all feeders know is so desirable in a steer intended for the feed lot. The distance between eye and horn should be short and the horn should be flat and of medium fineness rather than round and coarse. The lower jaw should be heavily coated with muscle; the muzzle, lips and mouth should be large without coarseness. In speaking of a large muzzle, we refer to the nostrils being prominent and the openings large.

2 Quality—We may here well distinguish between what might be called (a) general quality and (b) handling quality. (a) General quality. By general quality is meant general refinement of external conformation as seen in the head, horn, bone, compactness and smoothness of outline. General quality is affected by nothing so much as breeding; in fact the two are very closely associated. We seldom find good quality in a plainly bred steer and we generally find it in the well-bred, high grade animal. The desirability of general quality can not be too strongly emphasized. While it is a characteristic that involves many points and is difficult to describe, its presence or absence is quickly discerned by the trained eye of the intelligent buyer. It is this characteristic in the stockers and feeders more than any other that we may depend upon as indicating that the animal has within it the possibility of making a market topper or at any rate a prime steer.

The ability to select stockers and feeders which have within them the possibility of making prime steers is one of the first and most important lessons for the stockman to learn. Profits in steer feeding come not so much from skill in feeding and management as from intelligent buying and selling. The profit resulting from an increase during the fattening period, of the value per pound of the total weight of the animal is as important as that resulting from the method employed in the feeding and management. It is seldom possible to produce at a profit gains which do not increase the value per pound of the total weight of the animal. Hence the importance of intelligent buying, or the selection hf feeders and stockers of good quality.

(b) Handling quality. Good handling quality indicates that the possessor is a good feeder. It shows that the animal is in good health or thrift and capable of beginning to gain as soon as an abundance of food is supplied. We speak of cattle as possessing good handling quality when the skin is mellow and loose. A thick, mossy coat of hair of medium fineness and a moderately thick skin are also desirable.

3. Constitution—The points indicative of good constitution have practically been covered under I. Form Good constitution is indicated by a wide, deep chest, by fullness in the heart-girth, depth and breadth of body and good handling quality. While, as we have said above, we want refinement of form and bone, otherwise spoken of as general quality, we do not want that refinement carried to the point of delicacy in the animal. Too much refinement means delicacy or a lack of constitution and no animal lacking in constitution should find its way into the feed lot. The desirable characteristics of beef form, quality and constitution, should be found in well-bred high grades of any of the leading beef breeds. In the interest of uniformity in the finished product it ought to be observed that high grade Herefords can usually be put on the market in the fewest number of days and suffer most from carrying beyond the point of ripeness; that Shorthorns and Aberdeen-Angus grades, while a little slower to mature, are in fully as strong demand in the market as are grade Herefords; and that Aberdeen-Angus and Galloways may be carried longer on full feed than other breeds of beef cattle, without indications of bunches or rolls of fat which are so strongly discriminated against in our markets.

After all that may be said, however, as to breed, the important consideration is to see that the steer should be a high grade of some one of the beef breeds and that the selection of the individual should receive more attention than the selection of the breed.

CORNSTALK DISEASE.

[By Dr. M. W. Scott.]

I will make an attempt to call your attention to a few facts concerning that inexhaustible subject, cornstalk disease.

The cornstalk is looked upon with suspicion as an agent which sometimes seems to be incompatible with animal life; yet thousands of horses and cattle are turned out to feed upon it every year, and if anything happens to interfere with the natural laws which govern health and life of the animals the cornstalk is held responsible for it, and the question is, what is the matter with the stalks?

Before trying to answer this question, let us consider the cornplant in detail. I believe that the cornplant is subject to the natural laws which govern the vegetable kingdom. We plant the seed, it germinates and grows; we cultivate it, and it gets ripe; we take care of the seed, and the stalk is left in the field to take care of itself. It is subject to diseases like other members of the vegetable kingdom. Both animal and vegetable parasites may affect its growth, of which the vegetable parasites are the most important group, including such pests as smut, caused by the fungus Ustilago carbo and the Ustilago maydis; rust, of which the most important is Puccinia maydis; and ergot a fungoid disease not only affecting the ryeplant, but many other species of gramina, such as corn, wheat, etc.

About the time of maturity the most tender leaves of the plant begin to fall upon the ground, and there they become covered with small fungi of the genus Penicellum, Aspergillus, Mucor, Ascophora, etc. Small sideshoots, developing only rudimentary ears, die early, and in going through the process of decay contain innumerable numbers of the above named fungi. Now this is the actual condition of the cornplant as near as I can describe it.

Burrill, Billings and others say that they have discovered a germ that is the cause of the cornstalk disease. Others say that the cornstalk contains so much saltpetre when grown in certain places that the animals eating it die of saltpetre poisoning.

Now, after considering the various conditions of the cornplant, let us turn our attention to some of the other plants for comparison.

Clover is subject to the attacks of several fungi, of which the most important is the Peronospora trifolium, which exerts its irritating action directly upon the gastro-intestinal mucous membrane, or the formation of a toxic substance which, acting particularly upon the liver and the brain, causes what is known as clover disease. Straw of wheat and oats, when damp and going through a mouldy change, is affected by various fungi, such as Tilletia, Caries, Puccinia, Graminis, etc., causing derangement of the intestinal and urinary organs, followed by paralysis and death.

We have already seen that the cornstalks are sometimes affected by various fungi, and I am inclined to believe that if the fungi on clover produce clover disease the fungi on cornstalks are the cause of the so-called cornstalk disease. I have seen both horses and cattle die from eating straw covered with fungi. I have seen hogs die from the effect of mouldy flour. I have had considerable experience with the so-called cerebrities or encephalitis, described in our veterinary publications as being caused by wormy and mouldy corn, and I believe that all these conditions, the cornstalk disease included, are cases of fungus poisoning.

Cornstalks may be the cause of other conditions which frequently result in death. Sometimes cornstalks are cut up and fed to cattle and horses in July and August, when grass in the pasture is insufficient, and when fed fresh and in limited amounts I have never seen or heard of any bad results therefrom, but when the stalks have been cut at this time of the year and allowed to remain in the field for a week or ten days—long enough to allow the development of an active process of fermentation--and then fed, I have seen the most serious disease, with death following in one-half to two hours of acute tympanitis or meteorism. If seen in time the animal can be relieved by tapping. After the escape of the gas the animal gets well in a very short time. I do not believe that any other germ except the bacteria of fermentation could be the cause of the production of this gas, and the fact that the tapping and the escape of the gas left the animal well in such a short time is proof enough that this is not a pathogenic bacterial disease.

Acute indigestion and gastritis, with or without engorgement, with metastasis to the brain through reflex nervous action, is a frequent occurrence in the stalkfields, and I believe that neither the Burrill-Billings bacillus nor saltpetre have anything to do with it. Both horses and cattle are liable to overload themselves if allowed to have free access to the stalkfields, especially when first turned into the field. Cases of engorgement of this kind are often followed by paralysis and death, especially in cows. Now, regarding saltpetre poisoning, the question is, "Is it possible that the corn plant can absorb such abnormal amounts of saltpetre, even if the ground upon which it grows should happen to be very rich in saltpetre?" The statistics of chemical analysis of the composition of various plants are regarded as facts by which we can determine the amount of the various kinds of food and in what proportion they should be applied in order to get a certain result.

If it is a fact that the cornstalk, or any other plant growing under natural conditions, is of such a nature that it is a good, wholesome plant when grown in certain places, but a poisonous one if grown in another, simply because that place happened to contain too much of one of the natural ingredients of that plant, then the figures of chemical analysis are very unreliable.

Now we have seen that the cornstalk may be the cause of acute tympanitis, indigestion, gastritis, and fungus poisoning, simply because it is often eaten in excessive quantity or in bad quality. Straw, hay, grain and flour, fed in the same condition, will produce the same result; but it is a fact that while we generally take care of and save all other plants used for animal food, the cornstalk is left in the field to take care of itself, under the influence of all kinds of winds and weather. The dry stalks which stand there in defiance to all the elements of nature have become a mass of woody fibres, good for nothing except to cause indigestion.

The most tender parts, such as leaves and sideshoots, fall upon the ground, there to go through the process of decay, the ultimate process of reduction to its original state, dust. These rotten parts are generally eaten by the young stock, going through the active process of dentition, in preference to the other parts which require active mastication; and the young animal which has eaten almost nothing but these decaying, mouldy parts, dies of fungus poisoning; the older stock more frequently die from indigestion. Early in the fall I think there is some nutriment in the stocks, and there is generally some corn left in the field; and I believe if cattle and horses are allowed to eat a limited amount at any time they will do well on it, provided that the organs of digestion are in good order when this sudden change of diet takes place. Mild cases of fungus poisoning we frequently notice as toxic polyuria, caused by mouldy feed.

As an accessory cause in the development of the disease now spoken of I will particularly mention cold. Cold acts as a debilitant if long-continued or severe. It weakens the circulation, especially that of the surface of the body, causes internal congestion, and directly lowers all the vital energies.

In conclusion, I will call your attention to the fact that of all the disease-producing causes there is no single factor which has so much influence as the quality of food, and I believe that the cornstalk diseases, as well as many other diseases, is the result of the violation or non-application of the rules of hygiene. All plants intended for animal food should be cut when they are ripe, dried and saved properly. Water should be pure, plenty of it, and accessible at all times. Salt at least twice a week. Good shelter and plenty of bedding. When this is observed, disease will be reduced to a minimum.

BUYING, FEEDING AND SELLING THE STEER.

[J. G. Imboden of Decatur.]

MR. PRESIDENT AND GENTLEMEN—If there ever was a time that feeders of beef should get together and study the question of feeding, it is at this time. If I should say the feeders that have produced beef the last six months, or the last five years, have done a very good business, you would think that is true. To those who have followed that business and marketed the stock at $5.00 or $6.00 a hundred, the profits have been small. The older feeders are practically out of the business.

The average feeder today does not exceed five pounds of beef from a bushel of corn. When I say that I am stating it liberally. Beef production on 60 cent corn will cost $12.00 per hundred. There is no one that believes beef will sell in the spring for $12.00 per hundred.

I am situated as most feeders are. Most feeders have to buy cattle, but I buy cattle and corn. I havn't bought the cattle nor have I bought the corn. I would like to buy cattle with as much flesh on them as I can get. There are times when we can produce beef cheaper than we can buy it.

Business men today are satisfied with very reasonable profits, owing to competition. The man who isn't satisfied will not do business. It has come to the time when the feeder must be satisfied with very little.

We have been extravagant in the use of corn; we have been shoveling it to the steer a half bushel per day. We have wasted it. Feeders should have cotton seed meal, oil cake and bran in connection with this high-priced corn. I believe we will get better results for the amount of corn consumed if we can make beef cheaper. I believe by feeding cotton seed meal, oil cake and bran, we will make beef that will be worth more on the market. I think it is a great extravagance on the part of the farmer when he goes to feed and gives the corn and leaves the fodder. I think there is nothing better than shock corn for fattening cattle. I will give a shock of corn to a load of cattle. In addition to that, I feed ear corn or shelled corn. I will give to start cattle on, ground corn, cob and all, for about 60 days. After that I prefer taking the cob out. Cattle will do about as well on ear corn. I feed ear corn and shelled corn together. Ground corn, you will find, they enjoy; you will find they will take a little each day. You will find some of your steers will eat more shelled corn than ear corn; others will take more of the ear corn.

Clover hay is the very best food we can feed our cattle. Clover hay and corn is better than shock corn and ear corn. I think there is merit in soaking corn in the spring of the year or in summer. I think the food value is increased 20 per cent. There can be a limited amount of cotton seed meal fed continually, but farmers who have cattle and hogs together should discard cotton seed meal, from four to six pounds per day in connection with the corn. If corn is worth 20 or 30 cents, I would use more corn.

As to dehorning cattle, the cost of dehorning cattle is a great deal more than most feeders will admit. Of course the cost of dehorning is a trifle. I refer to the shrinkage. I find I have lost about two weeks' feed. I would advise farmers to dehorn cattle in the fall or in the spring, when they commence to come yearlings.

If I had 100 head of cattle in the feed lot and there was a bushel of corn left at 9:00 o'clock, I would throw that away. If they were fed at 5:00 o'clock I would want their troughs clean at 7:00 o'clock. I do not believe in allowing cattle to have corn to eat all the time. You have just wasted your corn and it is an injury to the cattle. I feed corn in the morning, shock corn at noon, and corn in the evening. I would rather feed a little short. In feeding oil cake there is no injury to the hogs, more than corn alone. Two and a half pounds is the proper amount per day.

The average feeder, if he gets 60 pounds a month, has a satisfactory gain. The man that can successfully carry his hogs through with the cattle will make the most money. The system of feeding cattle would be a waste unless you have hogs. I wouldn't advise putting fat cattle on grass. If you have lots of grass, buy somebody's cattle and put on the grass.

CAN THE SMALL FARMER PPOFITABLY FEED CATTLE?

[By Chas. Adkins, Bement, Ill.]

I think the most reliable information a man can get on cattle feeding or any other branch of agricultural pursuits is obtained from practical experience for a number of years in that line. I have never had any experience in feeding cattle on what is considered a small farm in this country. Have had some experience in feeding a small lot on a fair-sized farm for nine years and think a steer will get just as fat on a small farm as he will on a large one if he is fed as well.

To preserve and maintain the fertility of the soil is the first requisite of successful farming. If this could be done by raising corn year after year the farmers of central Illinois would have as good a thing as they wanted without feeding cattle, as they would not have to work more than six months in the year to do this, while the cattle must be looked after every day in the year. A great many farms, both large and small, are run in about this way and are paing good returns to the owner now. If this course is pursued for 20 years what will the children who inherit this land do with it?

Cattle feeding is generally considered from one standpoint, and that is, will they pay a profit in dollars and cents to the feeder after he pays for what they have consumed? That is, indeed, an important part of it. I think a man should consider also whether the farm is benefited or not by the cattle being fed on it. My experience with cattle has been something like this: Have fed a carload of cattle each year for nine years; think they have paid fairly well except in the years 1893 and 1894, when they lost money. The lot fed in 1894 just paid market price for the corn, and labor, hay, fodder, etc., had to be charged to profit and loss, mostly loss. Corn was 25 cents per bushel and the cattle were of good quality and bought at $3.50 per cwt. and made good gain, but sold in Chicago for $3.90.

Last year we fed 22 cattle worth $40 per head when we commenced feeding; fed them from Jan. 1 to May 18, say, in round numbers, 140 days; they ate about 1,200 bushels of corn, ground cob and corn together, at 40 cents per bushel, $480; 25 tons clover hay at $5 per ton, $125; interest on money invested in cattle, $25; taxes, about $5; rock salt, $3; coal for tank heater, $2; straw-stack in feed lot, $15; labor for feeding, $70. I found when the cattle were shipped we had in cost of cattle, feed, etc., $1,605. The cattle netted us $1,550, showing a loss of $55. Are feeding 21 cattle now of about the same quality or better, cost the same money, are feeding about the same way, except we are feeding 60 cent corn to them. When they are fed out in May we will have about $1,750 in them. What these cattle will bring can only be guessed at. If they feed out as well as I expect them and the present prices for fat cattle are maintained, which the Drovers' Journal claims fat cattle are $1 per cwt. higher than one year ago, they will bring about $1,775. About pay for their feed and other expense, I think a good quality of cattle will about pay their way and turn in a good price for clover hay or fodder and straw on the farm. They furnish feed for a few hogs that follow them that must be considered. They leave a lot filled with fertilizer that can be turned to good account.

Last year we had 60 acres in corn that we had taken one crop of clover off, fed part of the hay to this load of cattle that I gave the statement of; had covered 40 acres of this land with fertilizer from the cattle yards and got 40 bushels of corn per acre from this 60 acre field; had in 120 acres more in corn that made 21 bushels per acre, a difference of 19 bushels per acre, or $684 on the 60 acres of land. Now, this land, which is not naturally any better than the other land, produced about the same crop before. We now have another 40 acres, clover land fertilized the same way. In rotating the crops on a large or small farm the cattle come in, clean up other clover hay, pay a fair price for it and leave it on the farm to help produce better crops. A. P. Grout of Winchester, Ill., says the feeding of stock presents to us a market for our products, a better market than the one at the elevator, because when we feed stock we sell economically. We get the market price for the product and then have left upon the farm from 75 to 92 per cent of the soil fertility in the crop to put back upon our fields and to maintain the fertility of our farm.

I think it necessary to keep a few well bred cattle on a farm whether large or small. I do not think a man should jump in and stock up heavy to begin with, with any kind of cattle at any kind of a price, expecting to make large sums of money out of it; but think he should first determine to engage in it as a permanent part of his business for a number of years, lay the foundation in the best blood of whatever beef breed he prefers, avail himself of every up to date method of feeding and caring for his stock and gradually grow into it. Let him acquire experience and knowledge of the business as his herd increases. The small farmer should meet with better success with his cattle than the large farmer, from the fact he can give a small number of cattle so much better attention than the man with a large number.

Twenty years ago in Ohio where I spent my boyhood days, cattle feeding was conducted in about the same way it is here now—a few large farmers fed nearly all the cattle. Last winter I visited the old home and was in a small town on a certain day and seen several little droves of fat cattle pass by, sometimes two car loads, sometimes one car load, or 10 or 12 head, and as low as six in number. I said to a friend, "Where do all these fat cattle come from, and who is buying them?" "Oh," he said, "nearly every man who raises corn in this country now feeds it to cattle. Swartschild & Sultzberger keep a man here all the time and he buys nearly all the fat cattle and hogs in this part of the country. This is one of his shipping days." He seemed to be paying enough that they could not afford to ship themselves; and the small feeder sold for as good price as the large feeder if his cattle were as good.

When I was in this same little town before, the streets would oftentimes be crowded with corn wagons waiting their turn to unload. I did not see a load of corn going to market in the three weeks that I was there, but found in the country that those having a little surplus were selling it to their neighbors who were a little short.

When I thought of the corn wagons that had disappeared from those Ohio towns in that time, I said to myself, where will our Illinois corn wagons be in 20 years from now? Will they be supplanted by the fat steer and fat hog or not? One thing we can prophesy, that is if the land is bled in the next 20 years like it has been in the past, it will not take quite as many wagons to hold the corn as it does now.

I visited a friend who owned 122 acres of land; he was feeding two car loads of cattle and one of hogs; sold hogs and cattle to this buyer while I was there for 5 cents for both hogs and cattle. His little 6 by 2 fields showed that they were productive and well farmed; his stock of various kinds were of the best breeding and had such a business air that you could tell they were well fed and well sheltered. I asked, "What would you take for this farm?" "Oh, I would not sell it for any reasonable price; I refused $75 per acre for it a short time ago," he said. "I have fed all I have raised on this farm for several years and bought some corn and other feed beside, and I would hate to sell it and buy a run down farm for less money and have to build it up to where I have this one." I thought this man had about the right idea of running a small farm.

I think the handwriting is beginning to appear on the wall now. The small farmers are stocking up with a better class of beef cows, they are using better sires and are more inclined to keep the calf until he is 1½ or 2 years old; now and then one feeds a few steers and seems to be working his way into the business. The time is coming when something must be done to rejuvenate the small farm as constant cropping will get it after while and I think the steer will have to play an important part in maintaining the fertility of the small farm. If he is bred right and fed right he will pay the small farmer his board bill when he is sent away.

DAIRY DEPARTMENT.

STANDARD MILK AND CREAM.

[By Wilber J. Fraser, Chief in Department of Dairy Husbandry. Agricultural Experimen Station.]

The Department of Dairy Husbandry, of the University of Illinois Agricultural Experiment Station, in an investigation of the dairy conditions of the State, finds that in nearly all cities, at the condensing factories and many creameries, milk is sold by measure or weight and almost entirely without reference to its composition or food value. It is safe to say that half of the milk produced in the State is sold in this way. Only five cities besides Chicago have any system of milk inspection whatever, or pay any official attention to the composition of milk sold, and the only requirement in these cities is that milk must contain at least three per cent fat and 12 per cent total solids. The result is that milk varying greatly in composition is sold for the same price.

THE COMPOSITION OF MILK.

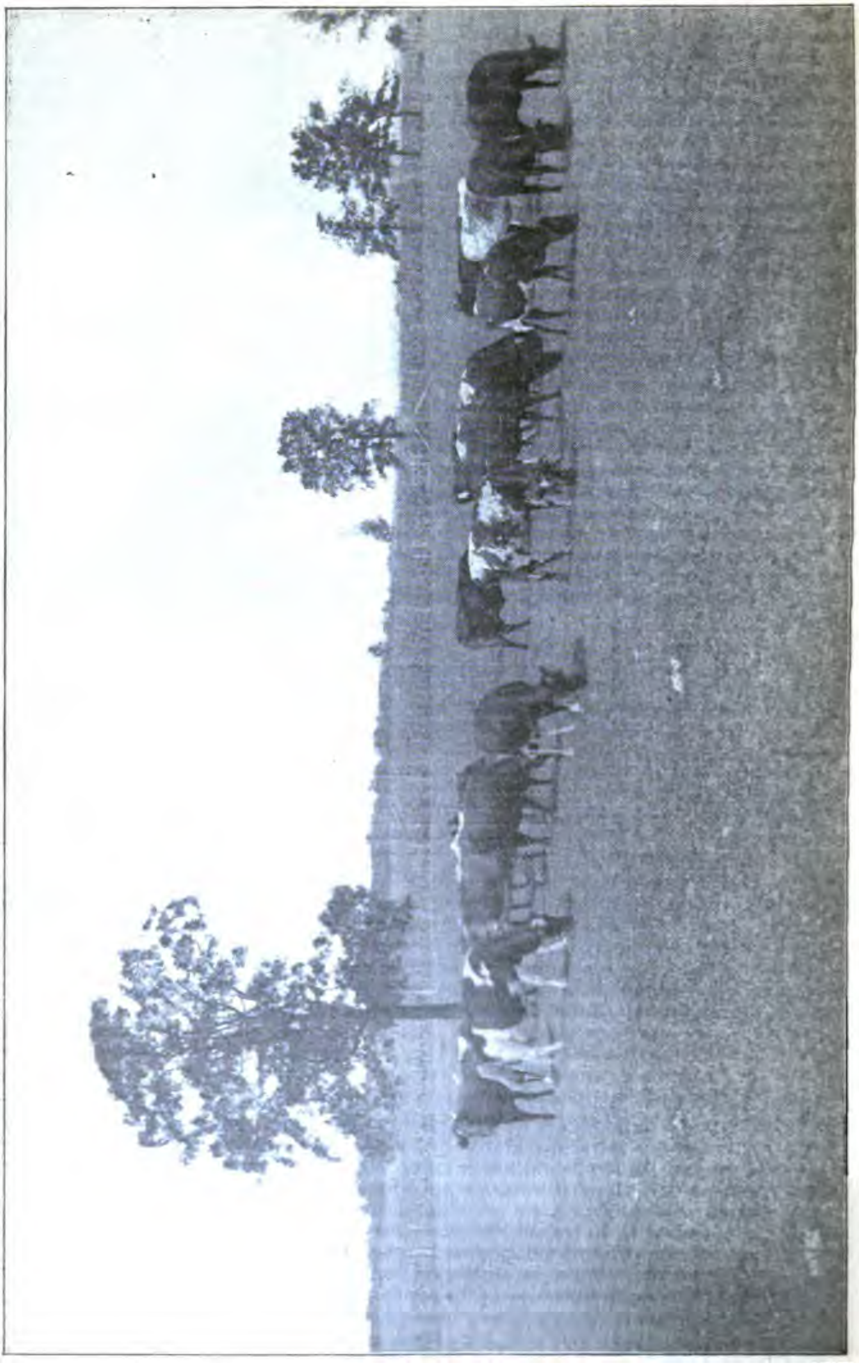
The average composition of milk may be fairly represented by the following:

	Per cent.
Water	87.50
Total solids	12.50
Casein and albumen	3.30
Butter-fat	3.50
Milk sugar	5.00
Ash	.70

The solids not fat are fairly constant but the fat is exceedingly variable. The fat in milk from different cows frequently varies from three per cent to seven per cent and greater differences than these are occasionly found. The chief causes are breed, individuality and length of time from freshening. The variations in the composition of milk are clearly shown in bulletin 51 of this station, published in May, 1898, and it is upon these variations in the composition that the food value of milk entirely depends.

THE FOOD VALUE OF MILK.

Milk furnishes all the constituents necessary to nourish the body, keep it in repair, and furnish warmth and energy for work. A quart of average milk will furnish about the same amount of nutrition as three fourths of a pound of meat; and if its true food value were fully appreciated, milk would be used much more freely than it now is, to the advantage of both the health and economical sustenance of the people. Each person consumes an average of 25½ gallons of milk in a year, or an ordinary tumblerful each day. Although this is one of the great dairy countries of the world, we do not consume more than one-third the amount of milk per capita that is used in some European countries. This is doubtless due to the failure of Americans to appreciate its food value. In this country it is generally used as a condimont in tea or coffee, on berries and fruit, or for a beverage when drunk at all and not as a regular article of food as are bread, meat and potatoes.



A small herd of grade dairy cows in a McHenry county clover and blue grass pasture; cornfield in background.

Many who understand that milk varies in composition think that its food value is based entirely upon the amount of butter-fat which it contains. While it is true that the fat in milk is a very important factor, it is also true that skim milk containing little or no fat has yet a high food value. Skim milk has practically the same composition as whole milk, with the exception of the butter-fat which has been removed in the cream, and for supplying the body with albuminoids alone is worth exactly the same, quart for quart, as whole milk. Since the albuminoids are lacking in the diet of many people, especially those who do not eat meat freely, skim milk would be a valuable and economical adjunct to their food. For the purpose of furnishing the body with energy skim milk is worth one-half as much as whole milk containing four per cent butter-fat. The objection may be raised that skim milk is not palatable, and while this is true to a certain extent, yet milk containing a small amount of fat makes an excellent drink and can be freely used to advantage, especially in cooking. The following table shows the real food value of milk compared with beef.

TABLE 1. AMOUNT OF THE DIFFERENT INGREDIENTS AND FUEL VALUE IN 25 CENTS WORTH OF WHOLE MILK, SKIM MILK AND ROUND BEEF STEAK.

(Estimated prices; whole milk containing 3 per cent fat, 5 cents a quart, skim milk 2.8 cents a quart; round steak 12½ cents a pound.)

	Amount.	Protein, lb.	Fat, lb.	Carbohydrates, lb.	En'gy value, calories.
Whole milk.......	5 qt.	.369	.325	.542	3066
Skim milk........	8.9 qt.	.657	.019	.966	3099
Beef steak........	2 lb.	.360	.240	....	1682

From the above table it is seen that equal values of whole milk and beef steak contain practically the same amount of portein, and that skim milk contains nearly twice as much, while the energy value of 25 cents worth of either whole or skim milk is nearly twice that of beef steak. In other words the energy value of 13½ cents worth of milk is equal to 25 cents worth of round beef steak. Yet people invariably consider milk as something of a luxury and think they are economizing by restricting its use as much as possible, although they buy meat freely considering it one of the necessities of life. They fail entirely to realize that the elements needed to nourish the body may be obtained from milk more cheaply than from meat, and that milk takes the place of other foods, thus diminishing the quantity of other nutrients needed. It is for this reason the quantity of milk consumed in this country is not so great as economy would warrant, considering its food value.

NEED OF STANDARDS IN THE SALE OF MILK.

In the aggregate an enormous amount of milk is consumed for it is used daily by nearly all classes of people regardless of their station in life; and, since it forms an economical factor in their sustenance, a correct basis of sale is important.

Taking, as a basis of comparison, milk containing 3 per cent fat and 9 per cent solids not fat, the required standard for milk sold in Chicago, as worth 5 cents a quart, sample No. 14, is worth 2.8 cents, and sample No. 38 is worth 8.4 cents, therefore one quart of No. 38 is worth three quarts of No. 14 on the basis of total energy value. Again, on the same basis, the average value of Nos. 1, 14 and 63, is 3.2 cents, while the average value of Nos. 38, 55 and 76 is 7.9 cents, therefore the better samples are worth 2½ times as much as the poorer, yet this milk all sold for the same price, 5 cents a quart.

Selling milk by measure alone is unjust to the producer as well as to the consumer. It would be as reasonable to expect to purchase three pounds of round steak for the price of one as to buy milk of the composition of No. 38

. 14 at the same price a quart. While the fallacy of this system is ap- to a few, the majority of people seem to think that milk is milk and e quart is worth as much as another, so long as it is still sweet. The for this is partly a lack of knowledge as to what constitutes good milk rtly because milk is an opaque liquid and it is difficult to judge of its ition or food value simply by appearance. For this reason many un- lous milk dealers dilute their milk with water or remove a portion of am.

legislatures and city councils have attempted to overcome this diffi- y passing laws and ordinances making it unlawful to change the com- ı of milk. Where these laws were enforced they stopped the dilution to a great extent, but did not tend to compel milk dealers to sell milk known composition or on the basis of its food value.

ıext attempt to remedy the difficulty was to have a certain standard which it was unlawful to sell milk. Most of the states and some cities laws to this effect. These standards seldom require more than 3 per t and 12 per cent total solids. The city or state standards, even where ist, have not reached the difficulty as it makes the sale of milk com- ect from some individual cows, that give milk low in fat, unlawful t is good wholesome milk and a perfectly legitimate product when sold roper price. But what is even worse, this system prevents the man oduces rich milk from getting the price he should according to its lue and cost of production. Milk containing a high per cent of fat is y worth more for food but it costs more to produce than milk contain- low per cent of fat and the price should be governed by its composi- d food value and not by its bulk.

re there was a ready means of determining the composition of milk ifficulties could not well be overcome and providing city standards of ition was about all that could be done at that time, but since the in- of the Babcock test, by Dr. Babcock of the Wisconsin Agricultural ment Station, the conditions are changed, for by the Babcock test and ter, and at but slight trouble or expense it is now a simple matter to ine accurately the amount of fat and solids not fat in any milk.

STANDARDIZING MILK AND CREAM.

fat in milk is the most variable constituent, the other solids remain- ly constant, standardizing milk is a comparatively simple matter. All necessary is to add or remove a certain amount of butter fat, which is lone by means of the centrifugal separator or by letting the cream rise ity. While it is true that milk from individual cows varies somewhat y to day, the mixed milk of a herd that is mixed at regular times each l be practically constant for that herd, because all of the cows will not h or low on the same day. By testing the milk of a herd occasionally cent of fat in the milk may be known at all times with reasonable ac- together with the amount of skim milk that should be added or removed it to the proper standard. If the separator does good work and the of milk handled is small so that it does not warrant testing every day be run very close to the desired per cent of fat by testing once a week be sure that it is up to the required standard. Where the quantity of ndled is large it is more economical to run tests frequently and keep at exactly the desired per cent. Even if the per cent of fat varies but it makes a great difference in profit in the course of the year in a usiness. If 1,000 gallons of milk are sold daily at the price given in and the per cent of fat in the milk is 4.5 when only 4 per cent milk is d, the loss to the one selling the milk would be 1½ cents a gallon or ay; this in a year would amount to $5,475.

nly apparatus necessary to standardize milk is a cream separator and ock milk test. Surely no dairyman who has a business of any conse- can afford to be without these machines. For dairymen handling but amount of milk the same results may be accomplished by setting the r a time and skimming off the cream. In this case all that is necessary is a Babcock test, which may be obtained from any milk supply house for $4. In this work skim milk containing practically no fat must be added or removed. If the skim milk used contains fat, proper allowance must be made according to the amount of fat contained or the results will obviously be different. Water cannot be used to dilute the milk or the per cent of solids not fat will be reduced.

As the per cent of casein, milk sugar and mineral matter are practically the same in milk containing different amounts of butter fat these are not considered in the following table. From this table it will be seen that a law compelling a man to standardize the milk and cream he sells would result in justice to both producer and consumer. All dairymen would then receive the legitimate price for their product according to its food value and cost of production and would not be selling 6 per cent milk in competition with 3 per cent milk and for the same price per quart.

TABLE 5—RELATIVE VALUE PER QUART AND NUMBER OF QUARTS IN A DOLLAR'S WORTH OF MILK OF THE FOLLOWING COMPOSITION AS TO FAT, COMPUTED ACCORDING TO THE FOOD VALUE OF 3 PER CENT. MILK AT 5 CENTS A QUART.

Per cent of Fat.	Price per Quart; Cents.	Number of Quarts a Dollar.	Per cent of Fat.	Price per Quart; Cents.	Number of Quarts a Dollar.	Per cent of Fat.	Price per Quart; Cents.	Number of Quarts a Dollar.
0.1	2.8	35.7	11	11	9	22	19.2	5.2
1	3.5	28.6	12	11.7	8.5	23	20	5
2	4.2	23.8	13	12.5	8	24	20.7	4.8
3	5	20	14	13.2	7.6	25	21.5	4.6
4	5.7	17.5	15	14	7.1	26	22,2	4.5
5	6.5	15.4	16	14.7	6.8	27	23	4.3
6	7.2	13.9	17	15.5	6.4	28	23.7	4.2
7	8	12.5	18	16.3	6.1	29	24.5	4.1
8	8.7	11.5	19	17	5.9	30	25.2	4
9	9.5	10.5	20	17.7	5.6	31	26	3.8
10	10.2	9.8	21	18.4	5.4	32	26.7	3.7

The objection may be raised that this system would be more difficult to control and would require more inspection than a legal standard, but upon careful consideration it will be seen to be no more complicated. Every milkman should be compelled to have brass figures soldered on the outside of his can, if delivering milk in bulk, showing the per cent of fat contained in the milk in that can. This system would prevent the man who was selling milk low in fat from evading the law by simply putting a "skim tag" on his can when the inspector appeared. In selling bottled milk the per cent of fat in the milk should either be blown into the bottle or stamped upon the pulp cap. This system would be of great advantage to the consumer as he would know the richness of the milk he was purchasing and not be paying for 6 per cent milk when he was receiving only 3 per cent. It would also allow him to obtain milk of whatever richness he desired and could afford. If this system were in practice it would not compel the shipper who produces the milk to standardize it but he would sell it by test to the city dealer or milk depot where it would be standardized. The shipper again would not be pooling his milk but would receive a price according to its food value and the cost of production.

DAIRYING.

[By Mrs. Chas. Beede of Chadwick.]

In making the effort to write something on the subject of dairying, the thought came that in all probability my hearers knew more about this extensive subject than I do, so perhaps to avoid difficulties it may be well to give some of our own little experiences in this line of farm work, hoping all personality will be pardoned. I should like very much to tell you that we run a dairy like those model dairies of Holland, accounts of which have been so entertaining in the Breeders' Gazette; dairy barns fine enough to dwell in, whitewashed walls adorned with fancy shelves full of polished tinware, white sanded floors, cows well groomed and contented fed on sweet succulent grass, and over all an all-pervading spirit of cleanliness. But I can not say so much—the only semblance that can be traced is the amount of work it takes to run a dairy. We do not make a specialty of dairying on our farm, but like many other farmers do general farming. We try to get everything possible from the farm without impoverishing the soil. We raise grain and hay mostly, to be fed to the cattle, horses, hogs and chickens, which are also raised on our farm. In raising cattle, our theory is that we ought to get something more than her calf to pay for the keep of a cow, so we milk the cow and make butter to sell, raising the calf on skimmed milk and grain. We raise the dual purpose cattle, those that are good milkers and good beef animals, those kind that furnish the subject for the learned discussions in our farm papers at the present time.

We began our dairy with a small herd of shorthorns, mostly grades, and some of them anything but gentle. Now our herd is mostly Red Polled grades. We find this breed very satisfactory for our purpose. They are by nature gentle. We seldom have to "break in" a heifer, as the saying goes. They want to be milked; they respond readily to good care and kindness, are good milkers and feeders. Ten years ago at State dairy meetings we heard it said very positively by professionals that there was no such thing as the dual purpose cow. A few weeks ago at the Freeport meeting of dairymen, we noticed in the charts giving Pan American statistics at Buffalo that the Red Polled cattle were given a place among the seven dairy breeds. We have used the Babcock test some in weeding out the poorer milkers, but not so much as we should. We aim to handle the cows gently; we object seriously to milkstool flourishes, accompanied with loud phrases. We ask of our help, kind treatment to all the dumb animals, and with very few exceptions they have given it. The man who clipped the cows' tails in fly time, making splendid clubs of them, did not stay very long at our place.

We have wasted very little time with hard milkers or kickers. If any such happened in our herd we sent them to the butcher as soon as possible. We take the calf from its dam as soon as convenient, because we have had trouble with young calves getting a sort of cholera if allowad to take all the milk they will drink. A good milch cow will give an abundance for two calves. We think it more profitable to have the larger share of cows fresh in the fall, although butter is better flavored if there are fresh cows now and then throughout the year. At present we are making butter from 26 cows, two of them strippers and nine young heifers. We have a yield of 24⅔ pounds of butter per day, besides the cream for the family. Surplus cows are fattened with the steers. We have used a separator for about eight months. Previous to this we used the Cooley submerged system. We like the separator better because we can separate the cream from the milk soon after milking and have the milk fresh and warm to feed the young animals. The separator is supposed to take nearly all the cream from the milk. The Cooley system practically does the same if milk is submerged in ice water, which with us was not always convenient to have. We use ice in summer to cool the cream. A one and one-half horse power gasoline engine runs the separator, churn, and pump when the wind does not blow.

All dairy work is done at the barn and a little dairy house near the windmill. We have improved our dairy appliances as we thought we could afford them. Our butter is sold on general market in Chicago. Dairying on our farm has its ups and downs, joys and sorrows. Among the joys the money, the objective point, comes first. Even if it seems small for the labor expended, the butter money is a fine thing to have. It is a steady income, something to pay every-day family expenses. A merchant in one of our towns says that the farmers who milk cows have money to pay their store bills and they pay them, too; no mean compliment, we say.

Like all other work on the farm, there is pressing need of intelligence and ability to make use of it. There is ample room for the student of nature and science to give his powers of research full sway. There is pleasure in working among the dumb animals. We find much in them that is human and much that appeals to our better nature. Their language, likes and dislikes, resentment to cruelty, quick response to kindness and good care, are interesting sources of study. They understand us better than we them. They are dependent on us for comfort and happiness, and in giving them this we reflect back upon ourselves those habits of kindliness and thoughtfulness, characteristics that are the foundation of true culture. One serious drawback to dairying is that it requires close attention twice a day, seven days in the week and 52 weeks in the year. The same objection applies to preparing three meals a day 365 days in the year; also paying our taxes once a year.

Another of our downs—we find it difficult to raise clover hay every year, and clover or its equivalent is quite necessary in helping the cows give a good yield of milk. We suffer from the oleo fraud; this winter especially, when the price of butter does not keep pace with the cost of production, through competition with this article, fixed up in spite of all law so that it is bought and sold for butter. Perhaps the most trying difficulty in dairying is the help question, although I believe it is no harder to get good help to do milking than to get good help for any other regular farm chores. In this horse and buggy era for the young man, any kind of chores are in the way of driving to town from three to seven nights in the week to spend much more than time and money. It is our experience that the good farm hand, although he may have his preference for some kinds of work, will do what is required of him and do it well. We have been quite successful in getting house help from homes where girls are accustomed to milk, and pay more wages if they help in the dairy. We are obliged to confess, though, that it is a little more difficult every year to get this kind of help. It looks as though the rising generation on our farms is not taught the useful art of milking.

Farm chores generally, that time-honored school of practical gymnastics and physical culture, is losing caste to some extent. Parents either do not find it convenient to teach their children, or do not wish them to learn. We note that frequently father and often mother do the regular morning and evening chore work, while the boys and girls drive to and from the town school, where Dame Fashion now declares are to be found the wisest teachers holding the latest and best patent on imparting wisdom, so there is no time for acquiring habits of industry and "sticktoitiveness," those habits that are unconsciously the result of regular and useful work, morning and evening, and very necessary habits they are, making a success in all lines of business. History says the boys and girls reared in farm homes with an abundance of rugged chore work that must be done regularly, and schooled mainly in the little district school, made the men and women who led and still lead the van in the march of civilization. Now, what of the future? Dame Fashion says the tendency is to concentrate the schools and leave out the little red schoolhouse entirely. The proposed concentrated school may help with textbook knowledge, but what fad in education will take the place of its complement of both brain and hand work, namely, chores on the farm? This may seem out of line with the subject of dairying, but it is not. Future dairying depends upon what the boys and girls of today are doing. Parents in farm homes who have the welfare of their children at heart, and they all do, may well look with distrust upon any system of education that will interfere with or crowd out the homely but useful, helpful, instructive duties of home life on the farm.

WHAT DAIRYING MEANS.

[By Mr. E. Rengel of Danvers.[

The State of Illinois ranks as one of the foremost dairy states of the Union, being credited with 566 creameries, but out of that number the central counties have only 26, while 432 are in the northern portion of the State and 108 in the south. Every farmer in our county keeps milch cows, for milk and butter are househould necessities. Some of our farmers aim to and do make as much out of their milch cows as out of any other branch of farming, whilst a great many keep them at an actual loss.

IMPROVED MACHINERY.

The system of handling milk and making butter and cheese has been entirely revolutionized of late years by the invention of improved machinery and apparatus so that a great deal of the work and drudgery is eliminated, yet the industry still involves a great deal of careful work to make it profitable, and this work can rarely ever be entirely left to hired help.

HARD TO GET HELP.

You can hire a man to do most any kind of farm work satisfactorily, but when it comes to taking care of milch cows it is hard to find the right kind of help. The very fact that the dairy industry admits of no vacation is a guaranty that it never will be overdone. Our county can not be counted as a dairy county and I doubt very much that it ever will. We built and run a creamery in the west end of Danvers a few years ago, and although it was given a good start and was well managed for a while, it soon failed for the lack of support or rather of milk, and is now converted into a dwelling house.

THE WAY WE FARM.

The average farmer in our county intends to farm about 80 acres to the man and team; 40 to 50 of that goes to corn, 20 to 30 to oats, leaving about 10 acres all told in pasture, in lots, etc. Now this means hard work from April 1 to December 1, with just now and then a little breathing spell; there is no time left to milk cows or even to feed them, and that job is left to the wife, or children if large enough, with the result that the cow goes dry about six months in the year.

200 POUNDS PER COW.

A cow ought to produce from 200 to 300 pounds of butter per year; if she gives less than 200 pounds, the cow or yourself or both together are at fault, and you had better quit the business or try to find out the cause, and apply the proper remedy.

THE BETTER WAY.

Now I want to give you my idea on the subject in consideration. Take your 80 acre farm for instance; instead of 40 acres, put out 30 in corn, 20 in oats, of which sow 10 or 15 acres in clover every year, thus giving you 10 or 15 acres of clover sod to break up every year. Your clover meadow will give you fully as good returns as either corn or oats.

SWEET CORN FOR FEED.

As near your pasture as possible drill some early sweet corn, and some later, so you will have plenty of feed along in July and August, when your pasture gives out. It will only take a few minutes every day to cut up some corn and throw it over the fence, and in this way you will keep your cows in milk, have butter to sell at a time when prices are good, will get just as much corn from your 30 acres as formerly from the 40 acres, have less work and more money and be happier all around.

BENEFIT OF THE INDUSTRY.

Every one that has been in the Elgin district has noticed the fine barns and farm buildings, for which the district is famous; these are necessary to successful dairying, and you will notice the same condition to prevail in our county—better improved farms were dairying is carried on.

READY MONEY

Another advantage is ready money; in any other branch of farming the farmer has to wait a considerable time for returns. Take beef cattle for instance; no returns can be expected in less than two years, hogs from eight months to a year, horses still longer; with grain selling the same thing. Not so with milch cows; you get returns every day or at least every week; this ready money is a great help to a community; you can always buy cheaper for cash than on time; it not only helps the farmer to keep the store keeper, the laborer, the mechanic and all that do business with the farmer; and besides many necessaries and commodities are procured where money is always available, and therefore the dairymen can really afford to live better than the grain farmer.

FRIENDSHIP AND EDUCATION.

There is a closer bond of friendship and brotherhood among dairymen than among any other class of farmers; they meet one another oftener, either in taking milk to the creamery, if there is a creamery in the district, or else on the weekly market day in the city.

It is also a great educator for your boys and girls, for as the work is light as compared with other farm work, the children can be helpful at an early age before they could do any other farm work; it, therefore, soon teaches them habits of industry, of kindness to animals, of cleaniness and order, for these are all cardinal virtues that are essential to successful dairymen, and "as the twig is bent the tree inclines," is eminently true with the children.

[FERTILITY PROBLEM.

Our crops are now confined to corn and oats, to very exhaustive crops, very little meadow even being raised, and the tendency with the renters at least is to sell the grain and keep as little stock as possible. A large amount of our high land has become thin by the constant cropping, and now the question as to how to maintain the fertility of the soil is the most important one to be solved. No system of farming can be said to be paying if it constantly robs the soil of its fertility, because sooner or later it will bankrupt the farmer.

THE COW A FACTOR.

In solving this question of maintaining soil fertility, the milch cow plays a prominent part; there is no other live stock on the farm that furnishes as large an amount of excellent fertilizer as milch cows properly kept.

Farmers in our county have generally an abundance of straw, and if cows are stabled in winter and properly bedded, the manure from the cow stable ought to go a long ways in paying for her board bill.

Clover succeeds well in our county and is one of the best crops to keep up our land; it is also one of the best of feeds for milch cows, and the three crops—corn, oats and clover—make a very good rotation.

THE LANDLORD'S PART.

In order to induce our renters to keep stock, it is first necessary for the land owners to provide the necessary buildings large enough, so as to enable the tenant to put all the necessary feed in shelter; it is to their profit as much as to the tennants. Under the present system of farming it will not be many years before there will be a sharp discrimination against land that has been rendered unproductive by constant cropping of oats and corn. We have in our county as good a land as there is on the face of the globe, and it is surely our duty and ought to be our pride to keep it so. Large land owners can easily do it by keeping and feeding live stock and changing the ground to meadows and pasture, and the most of them follow that plan.

But the man with the small farm or the renter who lives on the place only a year or two, has in the milch cow a sure and profitable way to not only maintain soil fertility, but to even increase the same, and it is surely to the interest of the landlord to help and encourage the tenant in every way in maintaing the quality of his land. "A stitch in time saves a big rent," and it is more profitable and easier to maintain soil fertility than to exhaust it and try to build it up again, and in this the milch cow takes first place.

CARE OF MILK AND MAKING OF BUTTER ON THE FARM.

[By Mrs. E. Y. McCarty, Tuscola, Ill.]

Bear in mind that when I speak of the care of milk and butter on the farm I speak from the standpoint of ordinary farm conditions as I find them in the rural neighborhoods and in nine-tenths of the farm homes. Possibly it is the woman's fault that she has not the helps and conveniences that other departments of the farm have, but with the exception of patent churns I find a large proportion of women work under the conditions and with the tools of our grandmothers. Coming from a dairy country where every farm of any pretension has its spring house and at least a dog churn, I felt like introducing some of these conveniences when I began my life on an Illinois farm. My first proposition was that motive power be furnished so the dog could churn. Alas! the owner of the dog objected saying it would break the spirit of the dog. Well, it didn't break the spirit of the woman for she soon found that she could turn the crank and read at the same time, when churning time became the brightest spot in the long day. Experience has taught me that if you would have pure milk and butter you must commence closer to the base of supplies than the dairy will take you; closer even than the cow stable. The pastures and meadows must be clear of noxious weeds. The water supply must be pure and plentiful. If on dry feed you must supply good clover hay. Will feed on ensilage, preferably some of each, salt where the cow can help herself when she pleases, as she is as fond of a change of diet as you are. Much less corn than is usually fed and no oats or oat straw for any cow if you please. The straw reduces the flow of milk and to my taste gives an unpleasant flavor to the butter. The cow is a machine to convert substances into milk and the quantity as well as quality will be in accordance with what you feed, Do not imagine you can turn her on broom corn stalks, water her when you think of it, and let her shiver in a muddy barnyard and get good results. Remember she warms herself at your expense, and what you save in stable accomodations you must give in fuel. In other words her rations must go for heat instead of milk. I remember once going into a dairy barn in New York in my childhood. It was such a revelation to me the picture has never faded from memory's wall. In the first place, floor, stalls, everything was scrupulously clean. The cows themselves were as glossy as well curried horses. Not a loud, angry word was spoken, and the attendants seemed to be on good friendly terms with their charges. The air was as pure as in the adjoining meadow. Perhaps the ordinary farmer could not afford to keep things quite as nice, but neither can he afford to deviate so widely from the course outlined. Boys hate to milk as naturally as girls hate to wash dishes. I can not tell you why, but I never found a hired man who would admit that he knew how unless you asked him before you hired him. They always were willing and even anxious to teach me the art, but I declined with thanks, for I already knew how to do more things than I had time to do well. Of course we all insist that the udder must be washed before milking is commenced, but just try suggesting this to the ordinary hired man or even suggest the washing of his own hands and see the look of astonishment with which he will regard you. Even when they promise to follow directions I always suspect that they are making mental reservations.

I see my successor is to speak on "Sanitary Milk Pails" so I will refrain from stealing his thunder. Now that I have reached my subject proper, the care of milk on the farm, I must admit that half of it is past redemption when it comes into the hands of the dairy maid unless she finds it possible to be milkmaid as well. But as in many other circumstances in life, we must accept conditions as they are and make the very best of them. So strain your milk immediately when it is brought in. Probably the man with the sanitary milk pail will have it already strained for you. We had one once and it had a strainer on it. The only objection to it was by the time you got the various parts put together you had to put your cow on stilts to get it under her and cool the milk about 40 degrees. I find it best even in a milk trough and in a milk room to cover it as soon as it is cooled. For this purpose perhaps cheese cloth wet and pressed down over the edge of the crock will be most convenient all things considered. I find that milk put in vessels holding not more than a gallon each gives the best result under ordinary farm conditions. I have tried the deep buckets but the results are not satisfactory.

Remember, I am talking to those who can not have the latest scientific achievements in the way of tools to work with. As soon as used, thoroughly wash and scald every bucket, strainer, cloth, milk vessel and cover and if possible sterilize with hot steam. Milk will take up a foreign odor with surprising quickness, so keep as far from all contaminating substances as possible. In hot weather put fresh, cold water in your milk troughs at least three times a day. If it could be so arranged that the water supply for the stock could be pumped through the trough it might save extra pumping. I tried this one year but did not find it satisfactory, as the men pumped so fast the water did not pass through the escape valve fast enough and I usually had spilt milk and a trough to scrub every day. During cold weather the method that has given me best results is this: After the milk has set 12 hours I set it on reservoir or back of stove when fire is low and raise the temperature to that of new milk; then I let it set 12 hours longer in a low temperature before I skim. In this way I nearly double the yield of cream. It is in a firm sheet and easily skimmed and keeps longer without getting old than any way I ever tried. When cream is scarce I can safely keep it four or five days just above the freezing point. Then when I have enough for a good churning I add a good starter of sour cream and bring it to a temperature of 60 degrees to ripen. It is almost impossible to add water directly to cream without injury. This is best done by setting cream bucket in hot water and stirring cream often. Cream so treated churns quicker, yields more and better butter and keeps the skim milk sweet longer than any plan I know of. Properly ripened cream is glossy on top, is thicker than ordinary cream and has a clean acid taste and smell. In cold weather complaints of trouble in churning are most numerous. Many who consider themselves expert butter makers occasionally meet with a refractory batch of cream that defies all efforts to coax forth its golden treasure. But ordinarily there is no cream so hard to churn that it is not amenable to proper treatment. Even a dairymaid who knows nothing of the scientific principles of the art of buttermaking can with judgment and good sense arrange to have the butter come in from 20 minutes to half an hour with as much certainty as pertains to anything here below, excepting only death and taxes. It is possible to make the best of butter with the old dash churn and butter bowl, but the labor involved is out of all proportion to results. If the butter fails to "come" it is due to one or some combination of the following causes: First, the churn may be too full; second, the temperature is too high or too low; third, the cream is improperly or insufficiently ripened; fourth, there is too small a per cent of butter fat, probably because there is too much skim milk with the cream. The churn should never be more than half full. It will often save time and temper to divide the churning, especially if the temperature is a little low; when churning commences the air and the cream are mixed into foam which fills the churn so full that no motion of the fat globules toward each other can occur and it is impossible to churn the frothy mass. In such case part of the cream must be drawn off, the temperature raised a little, when the butter will soon come. To have the temperature just right is a matter of the greatest importance, and next to a good churn the thermometer is the most important apparatus in the dairy. The expense is very slight and any druggist will get one for you. For the making of uniformly fine butter a thermometer is indispensible. The kind to get is a glass dairy thermometer that sells for 15 cents and up. The temperature may vary a trifle, but about 55 degrees in summer and 60 degrees in winter is usually the desirable temperature. The object of churning is not, as many seem to think, just to swing the cream about in the churn a certain length of time just as fast as it can be moved, but to bring the invisible fat globules that are suspended in the cream into contact with each other. If they are just soft enough they will unite under a steady stroke of the dash, the process going on until the butter "comes." If too hard or too soft they will not do this; that is why temperature is so important. If kept in too rapid motion they will not unite so readily. When the butter is in small particles about the size of a pea stop churning, draw off your buttermilk, and now doctors begin to disagree.

Some good buttermakers will tell you wash it thoroughly with cold salted water, some will tell you that washing will ruin the flavor, and so on. I believe if it can be thoroughly worked it is just as well without washing, but so few understand what thoroughly worked means that I believe it is safest to get out as much buttermilk as possible by washing, at any rate it must be gotten out or the butter will suffer in flavor and in color and will soon deteriorate. In taking out the milk press it out, do not pat or smooth it or you will break gloholes and make a greasy mass of your butter, which will ruin its selling qualities. Churning too long will also bring about this result. Having secured a good quality of butter it will pay you to put it up in good shape, according to the demands of the market you aim to supply. If it is a home market put it in pound rolls and stamp it so it may be known as yours. You will find a satisfied customer will hunt up your stamp a second time and will be your most successful advertiser. If you are so situated you can deliver regularly, find regular customers, they will gladly add 5 cents per pound for the extra accomodation. Be sure your roll weighs fully all it is sold for —an ounce over pays better than an ounce under weight. If your market is the city, get the most sightly and best made package, brand your name on it. Invariably ship to the same agent and give him a chance to work up a special trade for you. A gilt edged article always commands a good price. Nothing so insults a woman as to insinuate that her butter is less than gilt edged. I know from experience. In the early days of my buttermaking I sent a churning just finished to the store, and the merchant sent second rate price, saying the butter was too old to bring anything better. I had my opinion of that man's honesty, but I have learned since that newly churned butter may be old and strong if the cream is not properly kept; and, this brings me to the subject of butter color. If we are to cater to the public we must furnish yellow butter, and winter butter is not always that color. A scant quantity of liquid coloring matter added to the cream when churning is commenced has been most successful in my experience, but remember, the trade while it wants yellow butter does not want copper colored. And last of all let me implore you never get above learning better ways of work, better methods of doing things. Your mother and grandmother were doubtless successful and energetic women, still it does not follow that their methods can not be improved on. The energies of many a woman have been waisted in work which she had been taught was necessary, but which was entirely useless. Do not drudge, drudge! Let your intellect save your body wherever possible. Never get too old to learn. Cato mastered Greek after he was 80. Queen Victoria learned Hindostan in her old age. In this age of books and papers and agricultural associations you too can advance in knowledge if you make the most of your opportunities. Prove all things—hold fast that which is good.

In connection with this subject we might well consider some of the "by products." You know, in many of the large industrial interests the by products are what make the profits. If the skim milk and buttermilk can be fed on the farm they will doubtless bring best returns, but if you have a surplus a good market can always be developed among your butter customers. Buttermilk is always in demand at half the price of new milk, and even clabbermilk will not go begging. Try offering your customers well made clabber cheese, done up in appetizing packages, and delivered regularly once a week, and see how gladly they will try it. We are constantly inquiring how a woman may make pin money outside her regular channels of work. Here the country woman has the advantage of her town bred sister. It is so much nicer to sell people what they want than to make people want what you have to sell. Yes, it takes work and extra care to do all these things, but every calling has its drawbacks. If you are to get the benefit of the advantages of country life the law of nature says you must meet its demands. You may not believe it, but it is far easier to feed poultry or work in the dairy than to clerk in a store or work in a factory. Your body is better nourished for you know you have pure food gotten at first hand. Your brain is clearer. No noxious gases invade your work room and your heart should be happier, for be you wife or maid your future is secure; there is no one to "turn you out of a job."

Practical Dairying.

[By L. S. Dorsey, of Moro.]

I consider the best business on the farm to be dairying, but it is a business requiring very close attention. There are many difficulties that have to be met. The dairyman who sells butter has oleomargarine to compete with —the sales of oleo have doubled in two years. Dairymen do not object to the manufacture of oleo, but do object to it being palmed off on the consumer as butter. At the end of the first drouth in our generation dairymen are beginning to feel the disastrous effects. With no corn and no oats they are forced to pay nearly one cent a pound for every pound they feed their cows. The question confronting them is how they will get through the coming winter. The average dairyman will have a hard time.

In an address to which we listened yesterday evening we were told not to be "average men." There are many average dairymen. I want to be a practical dairyman. Every man in the business is not fitted for dairying. Many do not treat their cows as they should be treated to obtain the best results. We often see dogs sent out in the pasture to bring the herd in; sometimes the children are sent out to "hustle them up." In either case the cows come to the barn on the run, often overheated. In the winter I have seen dairymen turn out their cows to drink ice water. A man treating his dairy herd in this way is certainly not working to get the most out of the business. Bossie should be treated very kindly. Tell her that you will go in partnership with her; that no dog shall be permitted to chase her; that she will not have to drink ice water this winter; that she will have plenty of hay and oats and bran—in fact, that she shall have the best of everything she likes, even though it will cost you lots of money. In return for this you will find her doing her best in your behalf.

(Mr. Dorsey figured that the cost of feeding a cow at present prices was 17 cents per day, and that the product sold for 18 cents. He said that it was necessary for the dairyman to dispose of all unprofitable animals in order to pull through the winter. He spoke very highly of soja beans—they withstood the drouth better than any other crop. He secured 2,200 pounds of hay from half an acre.)

Armand Zeller of highland, who was on the program to lead the discussion made an interesting talk. Among other things he said:

"The Assistant Dairy Commissioner gives a review of dairy statistics which were collected with the view of ascertaining the present condition of the dairy industry and to be used as a guide in the planning of future work of his department. Replies were received from 142 farms, 94 of which were managed by their owners and 48 by tenants. Average size of farm was 148 acres, of which 103 acres were in cultivation and 36 in pasture. The average number of cows on each farm was 10½. The average amount of milk produced was 4,072 pounds, including 300 pounds for home use and raising calves.

"The result of statistics collected in 1895 showed the average yield per cow for the State of Illinois was 3,590 pounds.

"In 1899 the Helvetia Milk Condensing company had 160 patrons, 52 per cent being owners and 48 per cent renters. Average size of farms 138 acres, with 112 under cultivation and 22 in pasture. The average number of cows kept was 11.6, and the average number of calves raised 4. The average yield per cow was 4,654 pounds of milk with a maximum of 8,298 and a minimum of 1,289 pounds, to which should be added 250 pounds for home use and calf raising. Of these 160 farms the average yield was: On 17 between 1,000 and 2,000 pounds; on 16, between 2,000 and 3,000 pounds; on 44 between 3,000 and 4,000 pounds; on 39 between 4,000 and 5,000 pounds; on 31 between 5,000 and 6,000 pounds; on nine between 6,000 and 7,000 pounds; on three between 7,000 and 8,000 pounds; on one 8,298 pounds.

"Assuming the cost of feeding a cow to be $30 per year, it would take 3,750 pounds of milk at 80 cents per 100 for feed. The conclusion is that even with this high average on the 160 farms around Highland, only 83 made a clear profit while 77 lost or just paid expenses.

"On many of the farms where ten cows were milked, three or four yielded a good profit, two or three just about paid for their keep, while the balance wiped out the profit."

DOMESTIC SCIENCE DEPARTMENT.

Domestic Science.

[By Mrs. G. W. Shippy, Freeport, Ill.]

Woman's kingdom is her home. She should reign with the best conditions that can be afforded. Here she should have a chance to intelligently and with certainty perform the duties that come up as time rolls on. Hence the study of what we naturally see to be the ground work of our very lives. For we must eat, drink, sleep and keep clean, and the seeing to it all, that the conditions pertaining to these things are right does not require a small portion of a woman's life. The demands made upon the housewife, mother or overseer of the home are numerous and she should be one well prepared to meet the demands. We often pay dearly for our ignorance, hence the necessity of a thorough knowledge of the principles that underlie the home. In consequence we have this movement, this association of Domestic Science. When women of kindred views come closely together their work certainly will be improved. The thoughts that one mind may produce can be carried home by others and weighed in the balance by actual experiments, for after all our very lives are what they are through a process of experiments and trials. Our object is to study in close touch with one another the things pertaining to the welfare of our families and homes. Now what does this work consist of? Domestic science means home making. The work then consists of all that tends towards making the ideal home. In doing this the hands must be taught to work out what a well trained brain may suggest. It consists of a knowledge of the art that furnishes vitality for the body and sound activity for the brain through the nutritive properties of foods that are needed for such action. Many and varied are the foods that produce such results when properly prepared. With a knowledge of the chemistry of cooking used with thh necessary pure air required to supply the body with the needed oxygen to keep it in health, life will be rounded out.

Too often we withhold just praise for work done by the housewife. We don't appreciate each other's efforts enough. There are oceans in this little bit of sunshine. A look or word of approval will awaken in a woman a power that will convert the drudgery of house duties into a pleassure and thereby elevate the labor of the home to the one of the highest aims of woman, just what it should be. Then she will be studying the effects of her work upon her loved ones, and when she once reaches this state she will begin to be interested in the work of other women whose labors are identical with her's, and she will look for a means of exchange of thought, for she begins to see that in order to round out her life her friends must furnish her material by which she may overcome some of the diffiulties that confront her. One may teach her patience, another hope; one may teach her eagerness to act, while another with her caution and prudence may instill these qualities while she too, may have qualities she may lend in return. So each may share her gifts with the other and all together form a complete whole. This is the condition we hope to attain in the Domestic Science association, for the very object is mutual helpfulness to one another. There are many helps and books that treat directly upon the work of home. They infuse new life and energy into the workers by treating directly upon the work they are engaged in. We all know how easily the girl that has a knowledge of household duties can step into her own home and without embarrassment take up the work that her new life may require of her. The young housewife can educate herself now in the laws of sanitary conditions and the nutritive and scientific values of the foods she may use for her family and enjoy the good results that come from such an education. We want to see our girls and women grasp this opportunity.

It is through the kindness of the farmers' institute workers that we, the farmers' women and daughters, have an opportunity to work with them and present our part of the work in the home. The men are interested in better results from our labors. What we, as women, have to do is to become interested in one another, then will we advance with the work. In all the various women's clubs it can not be denied that the tendency is to draw from household affairs rather than toward them. Jessie Wade Manning, a club woman, in an article on Domestic Science, in The Woman's World says: "Outside of the managers and directors of the Educational and Industrial unions, where domestic science is taught, and of those studying and teaching the art, the woeful ignorance of most women on this subject, and especially of the bright members of our many clubs is deplorable and somewhat amusing. It is only a question of time when all women will be brought face to face with the fact that the classes of instruction covered by domestic science are doing more real good possibly than all our clubs and charities. Why? Because it helps those who are willing to help themselves. How? By classification and competent instruction."

FRUITS AND VEGETABLES.

[By Mrs. Nora B. Dunlap, Savoy, Ill.]

The dietetic value of fruits and vegetables is not recognized by the average American in the selection of his bills of fare, because he has learned not the science and philosophy of eating, but the gratification of the palate; he is subject to the likes and dislikes and also those of his father and mother, and even his great-grandfather and great-grandmother.

We are approaching an age when, from necessity, and perhaps the law of evolution being also at work, we shall teach the child principle in eating and not selfish gratification of the palate; when we shall deem it of greater importance to teach the laws of life and health than ancient or even modern languages, higher mathematics, or any of our various branches of study. We require hours of study, yes years of diligent, earnest work from the boy and girl student, and then leave them stranded on the pathway of life, because of the lack of the one science that would tend to make their life a success.

GIFT TO MANKIND.

Every active, progressive farmer should consider himself a benefactor of the human family when he brings any kind or variety of fruit or vegetable to a high and perfect state of growth for the consumption of man. For him the field is great for study. New varieties to be tested and perhaps improved upon, the knowledge of proper food and cultivation of each plant and fruit, and last but not least, the power by precept as well as example, to educate man to their hygienic and economic value as food.

VEGETABLES IN CELLAR.

I hope every farmer here has stored in his cellar for winter consumption at least eight or nine varieties of winter vegetables, plenty of canned fruit, not too sweet, and apples in quantity sufficient to be a part of the daily bill of fare during entire winter. If such is not the case, I fear you are not performing your full duty as a farmer to yourself and family.

WHAT FRUITS DO.

The nutritive value of fruit except in several instances is not great, but it conveys water to the system and allays thirst; fruits contain a variety of salts and acids that give tone to the system and enriches the blood to prevent scurvy; fruits act upon the kidneys and bowels; they aid greatly in the proper assimilation and digestion of the more condensed and bulky food.

THREE KINDS.

There are three chief kinds of fruit: food fruits, containing sugar, consequently of a sweetish nature, such as figs, dates, prunes, bananas, raisins, huckleberries and blueberries; sub-acid, such as apples, unless extremely hard, peaches, pears and sweet grapes; and the acid fruits, such as oranges, lemons, grape fruit, strawberries, cranberries, cherries, currants and gooseberries.

With the rapid transit now existing the fruit of the tropics can be upon our tables and is not much more expensive than the fruit raised in our midst.

FALSE ECONOMY.

It is said: "There is much false economy; those who are too poor to have seasonable fruits and vegetables will have their pie and pickles all the year. They cannot afford oranges and apples, yet can afford tea and coffee daily."

SORRY FOR THE CHILDREN.

In my country neighborhood I feel sorry for the children all around me, because their parents do not see the necessity of providing plenty of wholesome fruit and vegetables for their use the year around. They must put in all their broad acres with corn and oats, and think they have not the land or the time to devote to a fruit or vegetable garden. People consider meat, potatoes and bread actual necessities, but have yet to learn that the acids of fruits and minerals of vegetables are valuable adjuncts to a proper food ration.

KNOW YOUR NEEDS.

People must learn their own idiosyncracies and power of digesting the various kinds of food. To some the strawberry acts as a poison, causing pain almost immediately after eating, and with others strawberries produce a rash upon the skin. Rheumatic people should avoid the acid fruits, but can eat freely of the majority of the sub-acid fruits.

THE APPLE.

The apple is justly called the king of fruits. "Chemically the apple is composed of vegetable fiber, albumen, sugar, gum, chlorophyl, malic acid, gallic acid; lime and much water." The German analysts say the apple contains a larger per cent of phosphorus than any other fruit or vegetable. This phosphorus is admirably adapted for renewing the essential matter, lecithin, of the brain and spinal cord. The old Scandinavian tradition represents the apple as the fruit of the gods. When they felt themselves growing old and infirm, they resorted to this fruit for renewing their powers of mind and body.

FOR SEDENTARY PEOPLE.

The acids of the apple are of especial value to those of sedentary habits; they help to eliminate from the body noxious matter which, if retained, would produce heavy brain, jaundice or skin eruptions.

LUNCH OF APPLES ONLY.

The St. Louis Democrat says: Senator Cockrell is said to make his lunch entirely on apples and at the age of 65 enjoys remarkably vigorous health, which has led one of the other senators to adopt a similar diet. At 65 the Missourian displayed a capacity for work which is the marvel of the Senate. He is more vigorous than he was ten years ago. He attributes in no small degree his splendid health to the free use of apples and especially to his daily lunch on apples exclusively.

Senator Depew says: "After a man reaches the age of 60 what he eats has more to do with his longevity and capacity for work than public men generally understand."

DRIED FRUITS.

Our dried fruits, figs, dates and prunes, are very valuable, being full of levulose, the most important of the starchy foods, and rich in those salts which make bone and teeth and give color to the eyes, lips and hair. Levulose is the most easily digested of all food substances, being a natural pre-digested food cooked by the sun, a starchy food which has undergone complete amylolysis of nature outside the body.

PREPARATION OF VEGETABLES.

Great care should be exercised in the selection and preparation of vegetables. I know no place where direct science can be so well applied and with such satisfactory results as in the cooking of vegetables.

"The elements of nutrition are wasted in a great variety of ways by cooking, par-boiling, burning and in cooking too long or not long enough."

A TRAINED COOK.

Speed the time when man will demand and require as much knowledge and science of his cook as he does of his physician and pharmacist. When that time comes many of the physicians and chemists will be obliged to seek other employment.

MINERAL ELEMENTS.

Vegetables are rich in mineral elements and also give bulk to food. It would be impossible to live a healthy life upon vegetables alone, as it would require too much bulk to receive a proper ration of food. They should be used in combination with foods rich in carbonaceous and nitrogenous elements.

TOO MUCH POTATOES.

Potatoes have been easily grown and preserved, consequently the American people have learned the habit of making them too strong a staple of diet. A potato is about 75 per cent of water, 25 per cent remaining as food, with too strong a per cent of starch to make it a food perfect in dietetic proportions. In the majority of homes you will find the potato upon the table three times a day. I am beginning to believe less would be beneficial. Substitute rice and corn and they will give better food proportions. The nutritive value of the potato is 22; rice, 86; corn, 87.

STORING IN THE CELLAR.

Every farmer can and should live the best of any class of people, but too often he lives the poorest as far as supply and consumption of vegetables and fruits is concerned. The winter vegetables that should now be in your cellars in boxes, covered either with fine dust or sand, are carrots, parsnips, salsify, beets, turnips, cabbage and celery. Sweet potatoes and squashes should be wrapped in papers and kept in a dry, warm place. Onions should not be kept in a moist place but should be in about the same temperature as sweet potatoes.

VALUE IN CARROTS.

Carrots can be found almost a daily accompaniment to the Frenchman's dinner. Carrots contain sugar enough for making a syrup from them. Starch does not enter into their composition, but a small portion of pectose is found instead. Iron is said to be the mineral of greatest value found in the carrot and gives it its color.

The parsnip contains but little nutrient value, mostly starch and sugar, with 1 per cent of mineral matters. It should be handled with care in cooking and serving, as the fibrous matter makes it difficult of digestion.

BEET MOST NUTRITIVE.

The beet, owing to the amount of sugar it contains, is considered more nutritive than any other esculent tuber except the potato. It has blood producing properties.

CELERY FOR NERVOUSNESS.

Celery contains aromatic acid, sugar, starch and manna sugar. The daily moderate use of celery is said to remove nervousness and even palpitation of the heart. For rheumatism and kidney trouble it is considered excellent. Those having weak digestion should eat celery cooked, as the fibre makes it difficult of digestion.

The onion is classed among the vegetables of value as a blood purifier; it stimulates the secretions, and, like celery, is useful for nervousness. The strong taste and smell of onions is dne to volatile oil, rich in sulphur.

COOKING CABBAGE.

Cabbage, if properly cooked, is a valuable vegetable possessing marked anti-scorbutic virtue.

M. Chevroul, a French scientist, says "the odor caused by the boiling of cabbage is due to the liberation of sulphurated hydrogen." Cabbage can be cooked so that some of the principle will not be liberated and will remain as an aid to its digestion.

If it is put on in boiling salted water and allowed to simmer, never boil, from one-half to three-fourths of an hour, drained and served with either melted butter or cream sauce, even those of weak digestion can indulge in its use.

RAPID BOILING TOUGHENS.

All vegetables are composed of cells surrounded by a woody fibre, and rapid boiling toughenens the fibre and ruptures the cells, dispelling into the water and air some of the principles that should remain as food.

Spinach, called by a French physician "the broom of the stomach," is considered a blood purifier and a complexion beautifier, and should be found on our tables oftener than it is.

FRENCH SALAD.

Much of the health of the Frenchman, I believe, can be attributed to his use of vegetables twice a day, and especially to his salad, with dressing of oil and lemon juice or vinegar. Twice a day during my stay in Paris I had the pleasure of eating a salad, and such salads as only the French know how to make, by the perfection of the growth of the vegetable required and the manipulation of material that brings perfection to the complete product.

Lettuce, endive, chickory, upland cress and corn salad should be found among our garden products to be used for the delectable and health-giving salad.

CAUSES RHEUMATISM.

Our excessive eating of sweets, meat and starch without enough of the elements found in fruits and vegetables, is one of the causes of so much rheumatism, gout, kidney and liver diseases. We have more pyhsicians, according to our population, than any other nation, and they are not a poverty stricken class of people, either.

In the editorial department of Good Housekeeping for November, they make this statement: "Several life insurance companies in this country, England and Germany are offering reduced premiums to vegetarians, about 8 per cent reduction." If true, they are grasping the hygienic value of a diet of vegetables.

A wholly vegetable diet may not be advisable, but restricted diet of meat and sweets certainly would tend toward a higher standard of health and happiness.

THE SELECTION AND CANNING OF FRUITS.

[By Mrs. J. J. Nagle.]

We all realize that the busy housewife must economize with time as well as with materials, for it will not do in our day to give all our time to the kitchen and general housework. We must have some time for intellectual development, time for reading and meditation, or life will become a continued round of drudging. The day of Prince Bismark's ideal wife is past. Her time was to be given to the kitchen, the child and the church; in other words according to the German, her education must consist in the three K's.

How is it that with improved facilities in all departments of labor, so many of us continue to do the same things over by the oldest and most difficult methods? Before the advent of glass fruit jars our grandmothers spent many weary hours over the preserving kettles that they might have the delicious fruit in that highly concentrated condition. Now, we find that many a good housewife makes the canning of fruit just as laborious.

First to have good canned fruit you must choose perfectly ripe and richly flavored fruit. One serious mistake that some women make is by looking for bargains in "specked" fruit. When any fruit reaches that point, it rapidly deteriorates both in food value and flavor. Again, it often results in great waste, for the process of fermentation having commenced, a high temperature must be reached to arrest the process, and in the end bottles burst, fruit and sugar utterly lost and time and labor sacrificed—a case of being penny wise and pound foolish.

As to the best method for canning fruit, we will consider first, the materials; second, the progress. I am a believer in the germ theory. Harbor disease germs and they grow and increase. Let us be exceedingly careful with our fruit jars. Some good housewives think that it is sufficient to simply give the jars a good rinsing with clear, warm water or perhaps cold water from the faucet preparatory to using them again. I don't think so; they have been standing apparently empty for some months, and need a good, hot bath. The caps should be put on the stove in a vessel of water to which a little salsoda or some kindred substance has been added, brought to a boil and then rinsed. You can take care of all rubbers that appear perfect after first use for your pickle jars, but to be assured of success get new rubbers (and good ones too, at that) for your fruits. Reject all imperfect caps.

You can get your syrup ready several days or even a week before using it —whenever you may have time for it. Put into a vessel a quantity of water according to the amount of fruit you expect to care for, add sugar until syrup is as heavy as you desire, then let boil a few minutes. Some fruits need much more sugar than others, and the palates of some families is trained so as to require much more than others. You are supposed to use your judgment. It appears that the sugar refiners use Prussian blue to give granulated sugar that bluish white cast, and when your syrup comes to a boil a bluish scum will rise and you can skim off all the offensive matter. Then take the syrup off the stove and let it cool for use.

When your fruit is washed and ready for canning fill the jars with the fresh fruit, handling it carefully, and as fast as you fill the jar with fruit add the syrup at once until the jar is full. This adding of syrup immediately is especially necessary with such fruits as peaches, pears or apples—all such that discolor readily after being pared. Suppose two of us are getting peaches ready for the jars. We wash the fruit before paring it, and together try to fill one jar as rapidly as possible; when full, at once add the syrup before filling the second, and so on.

When all are filled, we are ready for the heating process. I use an ordinary copper wash boiler in which I place 13 jars when I have a large canning on hand, and a smaller vessel when I have only two or three jars to do.

Place the strips of wood in the bottom of the boiler, arrange the jars on the strips, then put cold water in the boiler until within one inch of the top of jars; place over fire, put on the cover of boiler and let remain until the fruit has come to the boiling point. With a knife or a spoon remove what scum may have arisen. When ready to remove dip out sufficient water so the jars can be easily removed without danger of scalding. If the jars are no longer brim full, have at hand some boiling hot syrup or water and fill them up. Adjust your rubbers and caps, and you can look on the result with satisfaction.

HYGIENIC COOKING.

[By Sarah V. Kinney, Trimble, Illinois.]

The most important think for health is healthful cooking. Even a threshing machine may be ruined by feeding into it wire and steel forks. This paper is not intended to be a work on the cure of disease, but on the prevention.

The farmer has the advantage over the city man, that he raises most of his food himself, and is thus delivered from borax and acids in his milk, chemicals in his meat and something else in his canned vegetables. Every substance taken into the body produces some effect, and the food on the table does this as well as the articles in the drug store or in the medicine closet. Many a life has been shortened by food unwholesomely prepared.

This may almost be called an age of dyspepsia. The cause of this is bad cooking, not unpalatable cooking, but that which is rich, indigestable and lacking in nourishment. Good health depends largely on the food one eats, and so good temper depends on good health, wholesome cooking is a great factor to preserve peace in the home.

When we consider what to cook we have a large field to cover. Difference in occupation makes a change in food necessary; the farmer and the student require different diet. The same food likewise is not healthful at all seasons of the year. In winter, heat producing food should be eaten, in summer the opposite.

It can thus readily be seen that no fixed rule can be given as to what we should cook. The safest guide is to cook that which affords the most needed nourishment, varying with the season and surrounding circumstances.

But the wisest selection of food is in vain if it be cooked in an unwholesome manner. Frying meat slowly while the whole meal is being prepared is a mistake. Meat, especially beef steak to be nutricious, should be fried quickly, with the fryer smoking hot when meat is placed in as soon as blood appears on top it should be turned, if blood appears the second time, turn again, cut into with a sharp pointed knife, if no blood appears it is done. Place in a dish with a close fitting cover until ready to serve.

Rich pastry contains much that is indigestible and very little real food. The cost of such if spent in good plain food would result in a better, stronger race of people. Spicing and reasoning food very highly is to be condemned as it results in an unnatural taste for such things and is ruinous to digestion. Boiling meat and vegetables very hard and fast, renders them less nourishing as the juices all escape in cooking.

These are but a few of the many rules to be observed in hygienic cooking. We might sum them all up by saying, "that the proper cooking of food is that which renders it the most nourishing." It is true the majority of appetites are trained to enjoy only that food which is highly seasoned and rich. When a food is known to be wholesome, do not shove it aside and say, "Oh, I don't like that," but just eat a little anwhow. There is nothing more easily cultivated than the appetite.

Children need careful training along this line. What mother doesn't know that a child if left to itself will make an entire meal on sweets.

Whenever American housewives take heed to that maxim "we eat to live," instead of the one now adhered to, "we live to eat," a new tide of health and prosperity will sweep over our land. The statesman has not a greater work than the cook. The safety of a nation lies in its well ordered homes. Let us strive for a reformation in the kitchen and the need of reformation in many other directions will cease. I don't know how many housekeepers I have heard say that the meal they most dreaded was breakfast. They knew what to have for dinner, and could get up a dainty tea or appetizing lunchion, but they never knew what to get when time came to plan for breakfast. You have learned how to cook eggs in many ways; to make appetizing dishes of potatoes, and to make toast and muffins and biscuits, and above all good bread. Surely you can find variety enough in this for all the breakfast of the year, if not add the fruits of the season.

In every household where there are children attending school it becomes the daily duty of the mother to fill the lunch basket with healthful appetizing food. Plain bread and butter alone may be made to look tempting and delicious if the slices are cut thin and the crust pared off, whether they are served plain or made into sandwiches.

Fruit is an important feature of the luncheon basket, and any kind that is in season may find a place there. It is easy enough to pack apples, grapes, bannas and such fruits, but what of berries? There your jelly glass with its metal cover comes in play. The berries may be put in that, closely covered, and you have them with no trouble. There is no need of sacrificing fruits since they may be so comfortably carried, and they are infinitely more healthful than other sweets.

Let every wife be as Solomon would have her when he says, "She looketh well to the ways of her household," and there is no doubt that as he farther says, "Her children will rise up to call her blessed."

THE FARMER'S DAUGHTER, HER RESPONSIBILITIES AND OPPORTUNITIES.

[By Miss Iola D. Reed, Lockport.]

Had we the power to bring before our view the centuries that have passed in some such manner as the boy shifts before his gaze the ever-changing colors and forms of the kaleidoscope, what a medley of scenes we would behold. But if we look long and intently we find that even in centuries widely separated we can trace some relationship.

Suppose we turn for a moment from our glorious twentieth century to a scene of the middle ages. It is the fifth century; the Roman Empire, with its pomp and glory, has been overthrown, and the position of prominence it once held is fast being transmitted to a strong race which is sweeping in from the north. It is in this new race, in these Teutonic people, that we are interested. It is true they gave to us neither literature nor fine arts, but they brought with them that which was of far greater value—love of personal freedom and reverence for womanhood. Tacitus says of them, "They deemed something sacred to reside in woman's nature."

Down through succeeding centuries respect for woman has become more and more universal until today her ability and power are recognized as never before. In the home, in society, in business, in college, her worth is known and appreciated. The daughters of our land are coming to the front. They realize that they have a place in the life of the busy world; they have felt the spirit of the century. But we are speaking generally; let us be more specific and consider the farmer's daughter, only; her responsibilities and opportunities.

It is not necessary for me to tell you that the farmer's daughter is not behind other girls, nor to take the time to name the noted women who have come from rural homes. The tale of the poor, overworked farmer's wife, and of the farmer's daughter growing up into womanhood hemmed in by disadvantages, is becoming obselete. The typical farmer's wife is not overworked; her home is furnished with all the comforts of life, and the farmer's daughter has no reason to complain of her advantages.

The words "responsibility" and "opportunity" are by no means synonymous. We may have opportunities which we do not consider responsibilities, and yet in one sense an opportunity is really a responsibility, for we are held responsible in proportion as we have opportunity.

First of all, it seems to me, there comes to the farmer's daughter that responsibility which comes to everyone, and that is the responsibility of making the most of one's life. I do not suggest that this responsibility be given first place with any selfish motive, but with a worthy purpose. The more deeply the daughter feels that she is responsible for the time and talents given her, the more eagerly will she grasp every opportunity for self-improvement, and she will seek self-improvement not merely for the gratification of personal desires, but because she realizes that the more capable she is the better able will she be to help those around her. It is somewhat the same idea as is expressed in those oft-quoted lines of Shakespeare—

To thine own self be true,
And it must follow as the night the day,
Thou canst not then be false to any man.

"Education," Horace Mann says, "is the fitting ot one for life's duties." So the farmer's daughter must have education, education not only of the brain, but of the conscience and the hands as well. Let her improve every opportunity of acquiring knowledge, for she will have abundant use for it, no matter what her position or occupation in life may be. Through the grades, through highschool and college, she will be gaining power and ability for future use. But perhaps the family purse is not full enough to pay her college expenses, or perhaps she cannot be spared from home to earn her own way; let her not be discouraged, for with the books, papers, libraries, Chautauquan and university extension courses which this age affords, in the shelter of her own home she may educate herself. College training for our farmer girl if possible, but if that is out of the question, by following some definite line of study, by reading good lectures and associating with refined people, she can can make up in part for the school life that is denied her.

"Life is what we make it." There are many ways and means of making life pleasant if we would but take advantage of them. Country life is not lonely or monotonous to those who know how to enjoy it. Nature presents a field of interesting study and has many a helpful lesson for those who come near enough to get acquainted with her. If the farmer's daughter would study plant and animal life she need not search for a botannical or zoölogical garden, for all about her are green fields and growing things. Here she may live near to nature's heart, developing mind and muscle in pure country air.

History shows us that in the past the farm has been not only an excellent place for developing mind and muscle, but also for the developement of strong character. While a girl's individuality is not wholly determined by her environments, for she may rise above them or sink below them as she chooses, yet it is true that her surroundings play an important part in the moulding of her character.

From her earliest days the farmer's daughter has had the opportunity of developing the ability to overcome obstacles. When as a child she began her school life she could not leave her home and in five minutes arrive at the schoolhouse door. She had to travel over a muddy road for a mile or more in all kinds of weather. She accepted it as a matter of fact and thought nothing of it. Thus she early came to the realization of the fact that if she would attain success in any line or possess anything of value, she must put forth a certain amount of effort; that where there's a will there's a way; that he who works will win. Too many have failed because their early training did not teach them this lesson.

Lacking the many companions that her city cousin enjoys the country girl grows up freer from nonsense and frivolity. She comes to appreciate the companionship of her superiors; she finds pleasure in books and study and learns to think for herself.

A former dean of the women's department of Oberlin college once said that she owed her success to the fact that when a country girl in the district school, alone in her class, without the help and inspiration of classmates she had to dig out for herself the truths and problems which her work presented. Hence by the very nature of her surroundings the farmer's daughter is taught those lessons of perseverence, self-reliance and independence which are so important in the formation of character.

The farmer's daughter should improve her opportunities to study music and art if she has the time and talent. There is an art for which nearly every girl has the talent if she would but cultivate it; the cultivation of it does not require years of study abroad nor does it make heavy demands upon the pocketbook, and that is the art of housekeeping and homemaking. If our girls realized the importance of this art and strove to acquire it with the same interest and zeal with which they would study music or elocution, what a difference there would be in a hundred of homes.

To many farmer's daughters there comes the opportunity of becoming farmers' wives. Sometimes they improve the opportunity and with it comes the responsibility of managing a household and making a home. It requires the tact and skill of a diplomat to successfully manage affairs of a household as truly as it does the affairs of State.

A knowledge of domestic science should have a place in the girl's education. She should know something of chemistry as applied to food, of the care of the sick, of the sanitation of the home. If she would be a teacher, a lawyer or a doctor she must of necessity spend a number of years in professional training. If she is to be a true homemaker does it not seem reasonable that she should have some training for her chosen work? How much depends upon the one at the head of the domestic affairs? The family separates in the morning each member going to his own work but all come back at night tired and hungry to the busy housewife to devour the food she prepares and to enjoy the rest and comfort of the home she keeps ready for them.

Any girl may feel proud to know that she has mastered the art of cooking. He who expends energy in hard labor either of hand or brain must be well fed, and poor cooking is undoubtedly the cause of much gloom, sickness and failure.

"A man ill-fed is a man depraved,
A man well-fed is a man half-saved."

May the farmer's daughter realize the responsibility of educating herself toward the home and not away from it. Everyone should have an ideal, and if the daughter holds in her imagination the ideal daughter, possessed of firmness, self-reliance, gentleness and all the virtues of true womanhood she will be the better for it. And the mission of the ideal woman in the words of Frances Willard "is to make the whole world homelike."

"The ornaments of the home are friends who frequent it." We would take this to mean not only the friends who come and go as guests, but those who share the home, the members of the family. What more beautiful scene than the farmer with his family around him—his womanly daughters and manly sons. Surely the ornaments of the farmer's home are his daughters. Too soon the family circle will be broken and each will go his separate way. Let the farmer's daughters remember her responsibility to father and mother and home.

For some girls it may be best that they should leave the home and prepare themselves for some occupation that will make them self supporting, for the girl likes to be independent as well as the boy. We would not discourage them for every girl to use a homely expression ought to know how to shift for herself. Fortune smiles and frowns and she may be suddenly thrown upon her own resources. It is then that she will find out the real value of the education and experience of her past years. So if circumstances are such that the daughter is obliged to spend much of her time away let her still be mindful of the interests of those at home.

In reading a message to girls written by one of the woman writers of the present day I found this thought expressed. "In our time it is exceptional to find a grown up daughter who after her school days are over is not reluctant to remain quietly at home filling in the chinks there and blessing the lives of her parents." There are many homes where the presence of the daughter is sadly missed. Our farmer girl snould not leave home without first considering the matter well. It may be her duty to remain there and brighten the lives of father, mother, brother and sister. She may imagine that working in the city where many are coming and going would be much more pleasant than working at home; but appearances are deceitful. In her country home the daughter is a queen. There she can entertain her friends, she has her horse, she can ride and go and come as she pleases. Working her way in the city she would be merely one of thousands slaving to keep soul and body together.

If our boys and girls have talent for some other calling in life we would not hold them to the farm but to those not favored with any particular gift and to whom farm life is not distasteful, and it is not disagreeable when rightly understood, we would say "stay on the farm." And in the home what a blessing a daughter can be. To her mother she becomes a companion and helper, sharing the duties of housekeeping and at the same time learning how to keep home clean and sweet. And where is a father who would not be proud to have a daughter interested in his work and help keep his accounts straight? Here to on her father's farm a daughter may gain some valuable instruction in business. She may have an interest in something pertaining to the farm. She may derive not only pleasure, but profit from the raising of poultry, keeping bees, the cultivation of fruits and many other thinks which girls can do.

No man liveth to himself and no one should be unmindful of the influence he is exerting on the community in which he lives. To shut one's self up in his own home taking no interest in his neighbor's welfare is to become narrow and selfish. We must add to our list of the responsibilities and opportunities of the farmer's daughter, the responsibility of being an influence for good in the community in which she makes her home. She owes it to herself and to her friends to do what she can to elevate the morals of the neighborhood, to encourage good society.

If she has talents let her use them. If she plays or sings let her do it for the enjoyment of those around her. In one way and another she can help to make the social life purer and better. Youth will seek some means of amusement. A litterary society may furnish that and at the same time promote culture and refinement.

With all the advantages which modern civilization and invention are bringing to us, country life is constantly being made more pleasant. The farmer is recognized as the provider of the world, and the farmer's daughter may stand today in the strength of her young womanhood as free as any girl in the land, to make her influence felt and her name honored.

ORGANIZATION FOR WOMEN'S WORK.

[By Mrs. I. S. Raymond, Philo, Ill.]

Before the days when Miriam, the prophetess, led in the wild song of triumph after the passage of the Red sea, and since the day when Mary worshipped at the feet of her Lord while her sister Martha "was cumbered with much service," woman's work has been and is varied and unclassifiiable. Some one has said, "These are the days in which women kill with clubs." The case of the woman who had nervous prostration, she being an officer in 34 different clubs and societies, may be a little unusual, but the trend of the times seems to be in that direction.

WOMAN'S NATURAL SPHERE.

Let us look at both sides of this question for a little while that we may arrive at safe and conservative conclusions. All good women in their hearts believe that a well kept home and the care of a family of children is a woman's true and natural sphere. Though domestic life has many cares and responsibilities, "the woman with a career," those women who are famous in literature, music and the arts, who never marry, will agree with his eminence, Cardinal Gibbons, when he says: "There is no life more exalted, more soul-satisfying than Christian wifehood and motherhood."

HOME LIFE.

The home is the natural and happiest place for a woman's talents and energies, and the house is not a home when the mother is away. She is the center by natural law and "she holds in her heart and hand all the threads of the lives being lived under her roof."

Nothing ever takes the place of a mother's loving and watchful care, and the daily teaching and exchange of confidences between parents and children is their greatest safeguard in a life of temptation, care and trial that all must meet. The family has functions that cannot be taken from it without unspeakable loss. The parent must realize that he has a duty and interest in the country exceeding the span of his own lifetime and his own interests.

The home is the original unit of the state and the ultimate test of its soundness, and the mutual education of parent and child in its atmosphere makes both the stronger for private as well as public duties.

DUE THEIR MOTHERS.

Most men will own that their victories in life are largely due their mothers, and the mothers have come to realize that it is necessary to look to all neglected classes in a community if they would rear their own children properly, and this brings us to the church and school, wherein for many years woman's work outside her own home was mostly directed.

SUCCESS IN THE CHURCH.

Every priest and pastor will tell you of the zeal and loving thought that the women of the churches put into their work. They do marvelous things in the way of church building and furnishing and paying off old debts. They keep up the social life of the church by their entertainments; they help to pay the minister and raise the missionary money, and they buy books for the Sunday school library. They spare not themselves in any kind of weather, but give of their time and strength and means most liberally—and right glorious is their reward! The good they do can never be calculated. What the Ladies' Aid society and the industrial societies of the churches have accomplished has led up to and made possible other organized work.

IN THE CIVIL WAR.

Long ago in the sorrowful days of the civil war how the women worked for the "Sanitary Commission"! Think of the work of the nurses in every land protected by the badge of the Red Cross society! and the comfortable clothes and shoes, and warm fires provid for the unfortunate and deserving poor by the good old-fashioned workers in the Dorcas society. The founding of hospitals and homes for orphan children has often been undertaken and carried out by women alone. The women have even ventured a little way into the political arena without loss in their home-loving and housekeeping qualities.

THE HELPFUL HAND.

"The hand that rocks the cradle rules the world," but to do this it must be an intelligent and helpful hand, guided by the thoughtful and energetic brain of the wise mother, and some of the helps that the mothers of today must depend upon come through the agency of the organized work for women.

Even Cardinal Gibbons grants that a woman has a few rights outside her home in the way of "recreation and exercise in the fresh air." None, more than the busy wife and mother can appreciate the rest and joy of a little time spent in a change of thought and surrounding. It is toil that creates holidays. "Traveling," says Richard Lassels, "makes a man sit still in his old age with satisfaction and travel over the world again in his chair and bed, by discourse and thought." If the busy mothers of little children may not travel herself, is she not favored if she can listen to the personal account of the travels of her more fortunate sister?

THREE HUNDRED THOUSAND WOMEN.

On March 18 Sorosis, called the "Mother of Clubs," will celebrate its 33d birthday anniversary. A year ago there were 2,000 clubs in the General Federation; there are many more clubs now in the federation, but the great majority of clubs are outside the federation, and the number of women belonging to all, according to the estimate of last year, was over 300,000; it is much greater now. Mrs. Croly, "Jennie June," the founder of Sorosis, has recently died, but she lived to see "The Woman's Club" a power in many towns and cities.

WHAT THE CLUB DOES.

The management of club work has trained the women to business habits, and to observe parliamentary rules has taught them self-control and courtesy to one another and gives them the benefit of intellectual exchange. It gives them opportunities for expression and thus enables those having high and helpful thoughts or useful experiences to share them with her neighbor.

One of my schoolmates who is a good and sensible club woman, and who without neglecting any of the home duties has been helpful especially in establishing free kindergartens in her home town (which, alas is a city of breweries), says: "Women are learning to be more systematic; they are learning to be helpful to each other, and as they consider great questions to put aside little pettinesses which are sometimes a blot on an otherwise lovely womanhood."

VALUE OF CO-OPERATION.

Women are learning the value of coöperation and as they can not vote (as yet) they find they can accomplish almost anything they want to by united effort, and creating a public sentiment in favor of improvement. We can think of many good things besides recreation and mental improvement that have come through women's clubs—the Young Women's Christian association, the W. C. T. U. and other societies. The cleaning up of cities, the establishing of bath rooms for public schools in overcrowded sections of cities, the playgrounds for city children, the appointment of women instead of men to care for women prisoners and insane patients have come through the thought of progressive women.

THOSE WHO WORK.

Many of the women who have been enabled to do good work in various organizations are the women in middle life whose children are grown and are often in homes of their own. This work outside the home has been a great boon often to childless women, or those who have met bereavement or have some living sorrow that is ever present with them. The taking thought for others and getting away from one's self is the best and surest cure for any kind of personal grief.

SECURE LAWS.

The beautiful rooms of the woman's club in the Studebaker building in Chicago has been the place where many a scheme to uplift and help humanity has had its start. A law which went into effect July 1, 1899, entitled, "An act to regulate the treatment and control of dependent, neglected and delinquent children," was helped through the Legislature by Mrs. Lucy L. Flower, formerly a trustee of the State University. The children thus to be looked after are those "who must rely on State care and State protection for any chance of a decent life, and the mental and moral training necessary for equipment in even the smallest degree for future self support or the duties of citizenship." We have the industrial school law, the manual training school law and the juvenile court law.

TWO LAWS NEEDED.

Mrs. Homer says: "Two things are still lacking. A law forbidding the detention of children between the ages of 3 and 16 years in any poorhouse in the State, and some law requiring or compelling a suitable supervision of all children placed in homes or institutions."

But you will begin to wonder what this talk about the city children has to do with a farmer's institute. In spite of Cato's saying, "The agricultural population produces the bravest men, the most valient soldiers and a class of men least given to evil designs," we do sometimes have unfortunate and helpless children even in country communities that need to be cared for by humane laws.

ASSOCIATION HISTORY.

The housewives and homemakers like the farmers, have only lately come to feel the necessity of organization, and for this we say all honor to the Farmers' Institute. At the request of the gentlemen, who generously offered to pay expenses, the State Domestic Science association was organized in 1898. The Champaign county association was organized in 1899. A part of our duty is to help with the program for farmers' institutes, and to organize township or neighborhood clubs when the women of the community desire to do so. Speaking from the experience of the last three years it is surprising to note the good that has come to us, in the realization of our ignorance, and the many things we wish to learn about house and homekeeping. Our little clubs bring the women of all the churches together on a common ground and we find the social side of the work a great benefit to us. The work is growing in a surprising manner, and other states are being organized on the same plan that Illinois is. To Mrs. Carter, Mrs. Dunlap, Mrs. Davenport and Mrs. King the women of the State owe a great debt. They made it possible to have the State Conference of Housekeepers at the University the last two weeks in January. Of course they could only do this through the consent and cooperation of Dean Davenport and Miss Bevier, Professor of Household Science and the hearty and cheerful assistance of various members of the University faculty and heads of departments.

We sincerely hope the women of Mahomet, young and old, will join hands with us and with others of our sisterhood, "to live and learn and be all that now charms distinctive womanhood.

LITERATURE IN THE HOME.

[By Mrs. Letta Musgrove, Hutsonville, Ill.]

Literature means the written or printed productions of the human mind, especially such as are elevating and above the commonplace. Home means growth upward, a fitting to mingle with the world. In order to have healthy growth it becomes necessary to have proper nourishment.

I believe that literature in the home means self-culture for the busy homekeepers. It is not altogether a pastime or recreation, although it may be a means to that effect. The main object of home literature is not so much the gaining of information as it is the cultivation of the critical judgment and the increase of the ability to understand. No matter how limited the time at command, if effort be directed to a single end growth will be apparent and steady.

It is a sad thing connected with the lives of human beings that our years of leisure and opportunity slip away before we realize their value or our own need. Then comes to us a clear vision of the relation between youth and later years. Preparation is seen to be the real business of the first part of life, and character and success follow in proportion to the fitness acquired. With this vision of later life often comes a settled conviction that it is too late for us to gain the breadth and intelligence that will fit us to come in contact with the world. I do not know who is responsible for the belief that persons of mature years can not learn as readily as children, but this pernicious doctrine is widespread and perhaps the majority of any community will assert it on first thought. It sounds very differently, stated in another way: You believe that your faculties had reached their highest development at the age of 15 or 20; that since that time they have steadily degenerated. If this be true, then of what use has it been for you to live?

The years have but served to weaken those qualities which give promise of immortality. The truth is this, and it is the very gospel of higher intellectual and spiritual life: Mental powers decay only through disease or abuse. If anyone possessed of ordinary health and under normal conditions can not remember as well as she did ten years ago, then she has weakened her memory through disease or mistaken application.

It is no uncommon thing to hear a woman scarcely past middle life say she can no longer remember as when younger. Her life has been a round of disconnected details. She has not forced herself to plan, to abide by her decisions, to remember, and therefore has suffered loss of mental vigor.

It is possible to throw away the best college education in the land in ten years after graduation by allowing mental activity to lapse as soon as stimulation is removed. Continued acquisition of knowledge and continued discipline of the faculties is worth more without the college training than the college training without the continuance. This is why some men and women who have never seen the inside of a college become more intelligent and cultivated than some others who are graduates.

Few thoughtful persons are indifferent to their own culture. Too many have lost faith in its possibility, and listen to a discussion of the subject with a consciousness of the difficulties that prevent. Let us consider some difficulties and find out if they are imaginary.

I apprehend that lack of time presses more closely upon the majority of us than any other difficulty. Now, I am not going to plead that we utilize our minutes and add a little study or a little reading. Most persons, and especially homekeepers, are already too busy, too hurried for wholesome living. We have little time for quiet thought, and little rest. The development of American civilization makes our lives more complex and increases the demands made upon us. Our only salvation is the individual right to choose. We can not do everything if we would. What shall be crowded out? Shall the choice be left to chance? Ten thousand things which are worth doing in themselves ought not to find place in our lives. The real question is not how profitable or pleasant a thing is, but what will it crowd out? Let us call judgment to our aid and choose the higher duties that call to us. Let each one consider what place self-culture holds in her scheme of life. If anything be crowded out, will it be our literature? I am not asking that we lead a selfish life. Growth of any kind is not self-indulgence. It calls for constant effort and self-denial. Self-culture is the highest duty of man. Without it the highest obligations of the home, the church or the state are impossible.

When we choose consciously or deliberately I have little doubt of the choice. The hopeless condition is drifting along carelessly. Many persons live on with little interest in the world of affairs or of truth outside their narrow circle.

If we could fall into the habit of estimating things by their cost in time as in money—for instance a piece of fancy work. Fifty cents worth of canvas and silk, 30 hours of time. What is the time worth an hour? What must be given up if your leisure is spent in this way? Do not misunderstand. For none enjoy these beautiful things that grow under skillful fingers more than those who seek the higher life of mind and heart. Some there are who may enjoy both; many choose plain living and high thinking or give up the joys and rewards of an intellectual life.

Another difficulty that prevents much literary study is the fact that mental activity becomes irksome. It is very difficult indeed to direct the attention to one line of thought or concentrate our thoughts to one subject. It would be easy enough if the habit was once acquired. One object of our associations is to acquire this habit and to aid the busy housekeeper in restoring mental activity. The more thought and preparation given to subjects discussed the more benefit derived.

Certainly the home provides plenty of literature for the growth of younger members. If the older individuals have a plan and a result at which to aim the culture of the home will be evident. In the rush of active life, while family duties and social obligations press upon the individual you will find the happiest people are those who are quietly developing the inner life in an atmosphere of home love.

Our Needs and What We Are Here For.

[By Mrs. E. W. Burroughs, Edwardsville, at Madison County Institute.]

Mr. President, Ladies and Gentlemen—The topic assigned to me has so wide a scope that it might be made to embrace our entire program and much more. Without infringing upon the subjects of other speakers, a brief statement of the last portion of my theme—what we are here for—is in order. We are gathered to discuss matters pertaining to the farm; to exchange ideas for our mutual betterment. A lifetime is too short for one to gain thorough experience, a thorough knowledge of all branches, or even a particular branch, of farming. The speakers are practical people, who have specialized a particular line; and the discussions had after each address show that many are here to learn.

Some years ago a well known farmer, successful in potato culture, was requested to prepare a paper to be read before a farmers' institute. He declined, on the ground that if he divulged the secrets gained by long experience there might be an over-production of tubers and his occupation would be gone. The subject was treated by another and our secretive friend was among the most persistent questioners. He afterwards admitted that the subject was ably handled and that he intended to try several new features. A lady who made lovely bread was once asked for the recipe. She replied that she did not like to tell for others could then make as fine bread as hers. Fortunately, we have none of this class with us. Some one has referred to the farmer's wife as the "mortgage lifter," so in speaking of "our needs" I may be pardoned for speaking of such as directly concern her and conduce to her happiness.

Farm life, by reason of its isolation, offers fewer charms than the gaities of the city. Some way must, therefore, be devised to bring us closer to our neighbors, our nearest city, and the world. The panacea within reach is twofold—the telephone and rural free mail delivery. The expiration of various patents on important parts of the telephone have lessened its cost materially. In our neighboring counties of Macoupin and Montgomery hundreds of farm homes are in communication with each other and neighboring towns, while in our own rich and populous Madison county less than half a dozen farmers enjoy telephone advantages. With a telephone the good housewife can consult her dressmaker, ascertain from mother the best remedy for baby's earache, or call the family physician quickly. Her husband can "hello" to his neighbor in threshing, harvesting, or any other time, or on busy days, and he can have the closing market quotations almost as early as his city cousin. The young folks, too, would like to be sociable; they could make their visiting engagements and might, even, during disagreeable weather, do their courting over the 'phone, while hugging the fireplace at home. But where is the farmer who sees and reads, that does not know that the telephone would be of incalculable benefit to him and his family? But the cost—there lies the trouble.

A subscriber in Putnam county figures the cost per mile as follows:

Twenty-five poles delivered and set at 50c each, $12.50; one mile No. 12½ wire, 135 lbs., $2.25; 25 brackets and insulators at 4c, $1.00; mounting wire and extras, $1.00. Making total cost of constructing one mile of line, $17.75.

A first-class phone in each house costs $15. The switchboard was placed in a private house and a connecting fee of $5.00 was charged each subscriber. Once installed, the annual cost to each subscriber did not exceed $7.50 a year for exchange expenses. The estimate is claimed to be conservative.

The other of our needs referred to—free rural mail delivery—is now obtainable by all communities. Over 3,000 routes were established last year, and nearly 7,000 applications are on file in the office of the Postmaster General for the establishment of new routes. It is predicted that within five years every farmer in the United States will have his mail delivered at his door. There are comparatively few routes in our county and we should be up and doing in order not to be left in the rear of the procession. What steps are necessary to secure a route? The Edwardsville Intelligencer in a recent issue gave the following information:

"The first step, usually, is for the citizens of the district to petition through their representative in congress for the establishment of a rural free delivery. This petition should set forth the nature of the country, whether it is thickly or sparsely populated, the leading vocations of the people, the character of the roads, whether good or bad, and the distance which petitioner has to travel or send, under existing circumstances, to receive his mail. If the member of congress representing that district or the United States senator residing therein is familiar with the local conditions and should forward this petition to the postoffice department with a favorable endorsement, a special agent is then sent out to look over the ground, to map out a suitable route or routes, to select carriers for appointment, and to recommend the establishment of the service, if, in his judgment, it can be successfully and economically carried out."

I can not conclude without a brief reference to domestic science, a most important subject to the American people. We need to train our girls not only to make good housekeepers, but to educate them in all that domestic science implies, to make them the strongest and best women on earth. Soon you farmer boys will need the best—when you have them guard their health, look after their happiness. Woman, mother, teacher of our youth, the guardian of our morals, the beckoning angel of our highest aspirations! The best we are is of her making, and the best we have should be given her.

HOW TO CREATE AND PRESERVE THAT ATMOSPHERE WHICH GIVES CHARACTER TO THE HOME.

[By Mrs. H. C. Confer, of Lena.]

In our Domestic Science society not only cookery is studied, but all phases of home life. Therefore, we thought this topic very appropriate.

We will look at the subject in its simplest form. How to create or make and preserve or keep that atmosphere, and by atmosphere is meant the surroundings and conditions which give character or reality to the home. Ah, the word home, what memories should cluster around this word of four letters. Are the memories always as dear as they should be? The first part of our topic is how to create a home. What make a home? First and above everything else we answer that love makes the home.

Where hearts are tender and thrill with love
  In castle or dugout bare,
That spot is blessed with heaven's decree,
  For truly a home is there.
And the angels flying about that spot
  Pause, while with spreading wings
To smile at the glimpse of heaven there,
  That pure and true love brings.

Without respect there cannot be love and without love there cannot be proper respect. How very important then when man and wife plight vows it should be with a sense of the responsibilities that will have to be met. But if true love exists these responsibilities will be met and overcome. Many times they start on life's journey with the brightest of prospects to build up a home, then make almost a total failure. Why is this? Perhaps each one has not given proper thought regarding that atmosphere in the home which will make it the dearest spot on earth.

Perhaps they have allowed selfishness to creep into the home; and how that monster with no redeeming qualities does seek an entering place at all times.

There may not have been the proper courtesy one toward the other, and, as I have said before, if love is to exist we must treat each other with respect. When we have dear friends we are careful that we treat them with respect, that we may stand high in their estimation. Is it not more important that we should treat our loved ones so as not to offend?

I have stated briefly these facts because no home is what it should be to children unless the parents' attitnde toward each other is as it should be. How can we expect to see children have the proper respect toward their parents and each other when the parents themselves show envy and strife? The old adage is that it takes two to make a quarrel, but, my dear friends, it also takes two to make a happy home. Both must work towards a common end—namely, that of establishing a true home in every sense of the word.

C. E. Sargent says: "Parents, your child is the blank paper on which is to be written the record of your own lives. Be careful, then, what you allow to be written there, for the world will read it."

Example is always better than precept. We should act as we wish our children to act. Never try to deceive a child, because they think more than we are willing to give them credit for. We should treat our children with confidence and love, for in this way only can we expect our influence to keep them from evil. Did you ever see a child that did not love to have his or her mother's confidence?

A certain author has said: "The crying sin of the American is their unwillingness to let their children grow. They wish to transform them into immortal genuises. They have more faith in art than in nature, in books and schoolrooms than in brooks and groves."

Is not this true? We forget our children must first have good physical bodies before they are hampered with education more than their childish wishes dictate.

I do not wish to be understood by this that education is not important, but that children must not be cramped, so to speak, for just as soon as too much is demanded of a young child it takes from its physical forces. "Every mother is the guardian of a bud of promise and whether she will or not must hold herself responsible for the blossom and let her not hasten to rid herself of that responsibility."

That bud will open soon enough. No bud develops as rapidly as a human bud. Let it remain a bud as long as possible.

The rose acquires its perfume while its petals are folded and the longer it remains a bud the sweeter will be the blossom.

A child can no more fully develop mentally, morally or physically without amusements than can a plant develop without sunshine.

It is the duty of all parents to make home pleasant and every child feels it has a right to a pleasant home and childhood. When they are denied this they are denied one of their rights because it is in the power of all parents, be they rich or poor, to have pleasant homes.

Let us give the children amusements and not be above participating in them ourselves sometimes. We all need times of recreation. It is as much our duty to do this for our children as to furnish food and shelter. If we take time to become companions of our children we can by so doing win their love and confidence.

There can such a bond of sympathy exist between parent and child that a child cannot do a wrong without confessing it to the parent. But so often we sever this bond by expecting too much of our children. They cannot always see things as we older ones see them and we ought not expect them to. We ought to put ourselves on their level and realize that their joys and their sorrows are just as real to them as ours are to us.

HOW MAY FARM LIFE BE MADE BRIGHTER FOR THE FARMER'S WIFE?

[By Mrs. C. M. Talbott of Jordan, Woodside county.]

It is not so stated, but the inference is, that the farmer's wife is not to be envied; in fact, she should have the sympathy of all well meaning people, because of her deprivations and hard time in general. As I understand the question the committee did not have that meaning in mind, but wished to have the thought brought out, how can we still add to the already bright and happy life of the farmer's wife, for such it is, if she is mistress of the situation instead of a slave to the manual labor of the farm home. It seems to me that looking backward from my earliest recollections to the present, that farm life for the farmer's wife has been growing brighter, because she is not now compelled to perform so much work that had to be done by her, in order that her family might have food and raiment.

The work of the farmer's wife has been hard because she had such a variety and so few conveniences for doing her work. I can remember the time when, if she wished for new clothing for the household, she had to wash the wool, pick it, have it carded, then spin it and weave it or find some one to do that for her, before she could cut and make the garments. Now she gets in her carriage, goes to a store and purchases almost any garment needed for the household. Only a few years ago she had nothing but a tub and kettle used in cleaning the linen of the household, the water to be carried from the spring or brook, up a steep hill, and cleansed before it could be used; there were no clothes pins for there were no clothes lines, and fortunate was she who had shrubs large enough to hold the washing, for the fence too often left its impress on the linen. Today many farm houses are fitted out with stationary tubs with hot and cold water from above and a drain beneath, with machines and wringers at hand. Only a few decades ago in this vicinity when the farmer's wife needed soda, she burned cobs and made it; when she wished for soap she made it of fat and lye of wood ashes; when she needed starch, she scraped potatoes and collected the sediments; when she prepared hominy she leached ashes, boiled the corn and after hulling it soaked out the lye when it was ready for cooking; when she wanted coffee she browned and ground it; when she needed molasses she boiled melon juice or pumpkins and made it. Today she purchases her soda, starch, molasses, soap and hominy, and the coffee comes ready for the coffee pot. Instead of carrying milk down stairs and up again, skimming and churning for hours every few days, she hands a basket to the milk hauler and the butter comes. If she is not too particular she can send to the bakery for bread, cakes and pies, and to the grocery for canned fruit. A few years ago if she wanted cheese she made it; if she wanted dried fruit she dried it. I can remember the time when if she got a letter from the home folks her husband had to work a half day to get money to pay the postage; now she has only to go to the front gate to post her mail or get it, and steps to the telephone in her sitting.room and visits with her neighbors and friends.

Many of you can remember when the farmer's wife had but one stove to warm the house and do the cooking. Now she has her steel range, gasoline and kerosene stoves, hard coal burners and furnaces, so that in the worst of weather she may be like one of our neighbors who moved into a furnace heated house; he was so comfortable that during one of the worst storms of the season he remarked that, "It is a very spring like day." It seems to me that the farmer's wife of the present day is not in a very pitiable condition. With pure air, uncontaminated water, fresh food, plenty of room, the modern conveniences, lack of noise, freedom from frequent interruptions and few demands on her afternoons and evenings, it seems to me that she is to be envied by her city sister. Notwithstanding the fact that changes for the better have been coming rapidly, there are others soon to follow. Instead of being a maid of all work she will become the home keeper. The washing, ironing and cooking will be done by experts in their different lines, thereby making the farm life much less irksome and therefore brighter. The other day one of my neighbors said, "I am sorry to have been absent from the meeting, but dinner and supper had to be prepared and served to 26 men." That was too much of a burden for any home keeper, and will be given into other hands. Cleanliness is next to godliness. If the farmer's wife will spend less time in cleaning and more time in keeping clean, her home and life will be made brighter. It is said, "Where ignorance is bliss 'tis folly to be wise." I can not understand how ignorance can be bliss, but I can understand how intelligence is bliss. I think the farmer's wife could make her life brighter by reading and study and by spending time in making better the condition of those around her. But how can she find time for such things? By using her brain so that every motion is worth something. By buying good material and then taking care of it. By using the time required in making pickles, salads, angel's and devil's food with other abominations so common; fancy work that lasts as long as the time you spend in making it, darned cushion covers that require so much time and eyesight. By wearing out clothes instead of making them into carpet rags. By not being penny wise and pound foolish in any direction.

The farmer's wife may make her life brighter by going out among people that she may learn from observation and bring herself contentment in her position, and by selecting those places of amusement that educate and elevate. She may add much to her happiness by entertaining her children at home, bringing in desirable associates instead of sending them out to fall among moral thieves and robbers. She may add much to her fund of enjoyment by travel, even if necessary to cut off luxuries in dress and food, not necessary to good health. It seems to me there is but one thing lacking to make farm life the most healthful, profitable and enjoyable and that is the opportunity to attend church, lectures, and concerts of a high grade. I have solved that problem to my own satisfaction today. Though I may not live to see it, it is nevertheless coming and is even now on the way. The electric road with convenient stations will solve this problem; then it seems to me the life of the farmer's wife will be the ideal one.

ECONOMY IN THE HOME.

[By Mrs. J. H. England.]

Webster tells us that economy is practical frugality; or, that careful management of money or goods which expends nothing unnecessarily and applies what is used to a profitable purpose. But I shall treat economy in its threefold aspect—social, practical and moral. Economy is impossible without ambition. I look out upon the whirling throng that rolls and tumbles past me on the great high road of life. Never ending is the wild procession; day and night you can hear the quick tramp of the myriad feet. Some are running, some walking, some are halt and lame, but all hastening, all eager in the feverish race; all straining life and limb and heart and soul to reach the ever receding horizon of success. Mark them as they surge along. Men and women, old and young, gentle and simple, fair and foul, rich and poor, merry and sad, all hurrying, hustling, scrambling; the strong pushing aside the weak, the cunning pushing past the foolish, those behind elbowing those before, those in front kicking as they run at those behind.

Look close and see the flitting show! 'tis a motley throng; prince and beggar, sinner and saint, butcher and baker, tinkers and tailors, plow-boys and sailors, all jostling along together. Cheek by cheek they struggle onward; screaming, cursing, praying, laughing, singing, moaning, they rush past side by side; their speed never slackens, the race never ends, there is no wayside rest for them, no halt by cooling fountains, no pause beneath green shades. On, on, on, through the heat and the dust; on, or they'll be trampled down and lost; on with the throbbing brain and tottering limbs, on 'till the heart grows sick and the eye grows blurred; and a gurgling groan tells those behind they may close up on another space.

And yet, in spite of the killing pace and the stony track, who but the sluggard or the dolt can hold aloof from the course? Not I. I think I more resemble the Irishman, who, seeing a crowd collecting, sent his little girl out to ask if there was going to be a row; "cos if so father would like to be in it."

I love the fierce strife. I like to watch it. I like to hear of people getting on in it, battling their way bravely and fairly - that is, not slipping through by luck or trickery. It stirs one's old Saxon fighting blood, like tales of knights who fought 'gainst fearful odds that thrilled us in our school days; and fighting the battle of life is fighting against fearful odds too. There are giants and dragons in the twentieth century, and the golden casket that they guard is not so easy to win as it appears in the story books. So much for ambition.

What is social economic work? It is the social process, the economic basis of all human life. For example, men work and make their horses work, but a free, independent animal does not work; he uses his efforts to secure his dinner, but this is not work. The only example of work socially and economically done by the lower animals, are the beaver, the bee and the ant. We say he works like a beaver, but would hardly say he works like a bird. The reason for this distinction is clear; the bee, the ant and the beaver exert themselves, not each for each, not merely parent for child, but each for all. They have common interests, and make a common effort to serve those interests, with the result of developing a higher degree of prosperity, and also of ability and intelligence. The bee is a mason and a nurse, besides the primal business of food getting The ant keeps cattle, makes war, holds slaves, digs tunnels, builds roads. What a lesson here for intelligent human beings. We do not say the papa ant or the mamma and do all things, but the collective family of ants, all working together, each sharing the other's burdens, each sharing equal respect and honor for his or her part well done. It is so in our human affairs.

Do women always get equal credit with men, or does her work in her home for her family which is often wearing and intense, amount to nothing in the eyes of her lord? If such be the case she has little encouragement to attempt more. By this I mean, woman with no inducement from her husband, with every dollar she has helped to earn carefully guarded in her husband's pockets, fearing she will spend a nickel on herself or family, begging a pittance of the money she has made, finally gets a little after explaining her needs and the least amount she can get along with, half that amount is ruefully doled out to her; now, with such a husband as this, woman can do little in an economical or financial way.

For, with a small amount of money she can often make $1 go as far as $2 in purchasing food and raiment for herself and family. Woman is the natural purchasing agent for the home, and yet there are some men in this enlightened country who think and act otherwise. We must see to achieve any financial success. Woman and man must work together, each honoring the other's efforts, advising in all matters of business to be carried on by the other party. Where one is weak the other may be strong, having perfect respect and confidence in each other's ability.

Under such circumstances and with such companionship woman can save and make almost as much in the farm home as man can on the farm. But we know the foundation of our financial success (be we farmers, mechanics, merchants, miners, doctors, lawyers, teachers, railroad men, or in any other line of business we may follow), is economy in little things. And yet, how many of us make a close study of these little things in our home? I do not think successful farmers' wives need a lesson in economy. It is rather the wives of laboring men and last, but not least, the laboring man himself; for most of them despise the day of small things. They think it is stingy and close, and are ashamed to take care of the little things of life; hence they never have any large ones to care for. "They won't take care of the pence, so they have no pounds to put in the bank." You can not fill your rain barrel if you do not catch the drops. What with waste in the kitchen, waste at the table, and waste at the drinking-house, fools and their money soon part to meet no more. If we do not save while we have it, we certainly shall not save after all is gone. There is no grace in waste. Economy is a duty; extravagance is a sin. Money once spent is like shot fired from a gun; you can never call it back, no matter how sorry you may be People who have nothing are very apt to be thought worth nothing. Mind, I don't say so, but a great many do.

Wrinkled purses make wrinkled faces. I should not care to spend all my money to buy a mouldy repentance, yet this is what many a prodigal has done and many more will do. Foolish lavishness leads to dreadful wickedness. Money is not the chief thing. It is as far below the grace of God and faith in Christ as a ploughed field is below the stars; but still godliness hath the promise of the life that now is, as well as of that which is to come, and he who is wise enough to seek first the kingdom of God and His righteousness, should also be wise enough to use aright the other things which God is pleased to add unto him.

These are some of John Ploughman's truths, but I think there is enough common sense and economy in them, if we would learn and practice them, to hinder our lives from being failures through thriftlessness and waste.

We have merely touched on the little economies of the home. You possibly know them much better than I do. So now we will see how we may use some of the little things on the farm in making our pin-money.

Take poultry, for example. People figure and calculate over the immensity of the value of the poultry product of the country until one is naturally led to think that there must be great poultry establishments where chickens are raised by the thousands and thousands and where eggs are laid by the barrelful every day. But it is not so; there are no great central points. True, there are sections where nearly everyone has a good, large home flock or two, and where there is a large surplus of eggs to be found. But there is no one single great big chicken and egg farm or ranch where the output in eggs and chickens is wonderful. In the east there are said to be some pretty good-sized duck farms and some places where a goodly number of chickens are raised to frying size and then marketed; but their whole output for a year would not feed a city like New York for one week. It is the little, home flocks, the dozens, the hundreds and thousands of home flocks, scattered all over this great country, each contributing a little to help swell the whole, that make up this great and valuable poultry product of the country. When that is estimated or counted up it is not counted solely by the number of eggs or chickens bought, sold or shipped, but in addition it takes into account the eggs and chickens consumed at their own tables, and so the home flock, small though it may be, bears its proportion of value in the grand estimate, and every egg laid and every chicken raised has its particular place in the grand total. The poultry industry is an industry where little things count; all picked up, saved, made, by woman.

Any woman can and I know a number of my neighbors who do take, say four good Jersey cows, and sell from them $300 worth of butter a year, besides raising $50.00 worth of pigs with the surplus milk; $100 for chickens, $300 for butter, and $50.00 for pigs, and you have $450 Small things, you say. Oh, yes, of course; but if you had to take that amount out of your wheat crop, some of us wouldn't have much left, I fear.

Home is the training school for those who must fight the battles of our future, and the hospital where the bruised and wounded may come for healing and renewal of a needed strength. Home everywhere is woman's kingdom, but home on the farm is peculiarly so. Is there any substitute for woman's queenship in our homes? Is there any other who can sway the gentle scepter like she? We learn the purest, best and most valued lessons of life around a sainted mother's knee and amid the hallowed influence of a mother's home, sanctified by the angelic purity of that ever-present mother. Where would we be today if the mother of a Watts, a Washington, a Lincoln, a Garfield, or of hundreds of others whose lives are the greatest boon and the results of whose lives are the proudest boast of any people on this earth, had not their mothers on the farms instilled the principles of right and honor into their early lives while they were yet passing through the embryotic stages of early boyhood?

Some one said, long years ago, that early impressions are the most lasting. Who, and who alone, makes these early impressions? Mother. Who first teaches the true doctrine of manhood and womanhood and first inculcates the heaven-edited precepts of a pure morality? Mother, Who eradicates the noxious weeds from our childish hearts and implants the sweet flowers of love and of truth? Mother; no one else but mother. What would we have been, what would home have been, what would we be, without a mother?

The wife stands beside the man of her choice, and when the waves of adversity roll highest, when the blasts of misfortune howl loudest, and when the sirens of temptation sing sweetest; when boasted manhood is quailing and stalwart strength is weakening, must she, with the devotion of a wife, the magic of a fairy, the skill of inspiration and the heaven-directed success of a true and faithful companion, quiet the waves, rebuke the winds, hush the tempest's voice, inspire the heart, and breathe into the soul of her husband resolutions that bravely meet and faithfully discharge the duties of life with benefit to his kind and with honor to his name.

Food Requirements of the Body.

[By Mrs. S. E. Harrison, Grundy County.]

It has been found that the very act of living necessarily implies not only a transformation of energy but an actual waste of the matter of the body in all its parts and organs and that much of its energy is derived immediately from material which has already become part and parcel of its various mechanisms.

So that if life is to continue, it is necessary that the process of integration and disintegration should balance. In other words the receipts in assimilable and oxidizable matter must balance the expenditure in both matter and energy.

The real material of which the body in its entirety is constructed, and with which its waste is repaired, is manifestly our food.

In its widest sense, the word food may be said to comprehend all things, which, when taken into the body, contribute to its growth, or maintainance, or healthy action, but as generally understood, the term is used as referring to such things as require digestion in the body. These substances are divided into two great groups, nitrogenous and non-nitrogenous, having nitrogen, having no nitrogen.

The nitrogenous or flesh-forming elements of food are albumen, fibrin, casein, segumin, gelatin.

The non-nitrogenous are fats, oils, starches, sugars—Heat producing.

In addition to these are mineral foods such as iron, lime, salt, etc.—regulators of energy and nutrition, found largely in fruits.

The proportion of water in the body is estimated at $^{2}3$ or $^{3}4$, or nearly 70 per cent. We will now consider the nitrogenous elements a little. Albumen, found in the white of eggs in almost identical form that it is found in the serum of blood, occurs largely in animal food, and to a less extent in vegetable food also; peas, oatmeal and beans containing more than other vegetables. Fibrin is found in both animal and vegetable food. It constitutes the principal part of lean meat. Fibrin is found in solution in the blood but when obtained clear of the other constituents it forms long elastic filaments.

Draper's Human Physiology says it is probable that the blood is constantly coagulating in the system, and the fibrin thus formed is immediately used in building up the tissues and supplying waste. Whether this be so or not, certain it is that if a vein be ruptured it begins at once to coagulate and stop the flow of blood and repair the breach. It also helps to heal broken bones and other wounds. It may perhaps be interesting to know that alcohol destroys this power of coagulation. Casein found in milk and principal constituent of cheese. Vegetable casein is called legumin, furnished by peas, beans, etc. Gelatin is not of great food value, is found in calves foot jelly, glue, etc. The non-nitrogenous elements are found in fat meats, suet, butter, oil, nuts of all kinds, starch, sugar, fruits and vegetables.

Now as to the proper proportions and amount of these elements required daily, the age, employment, season, surroundings and temperament have so much to do that it is impossible to lay down an infallible rule.

People while growing require more food than at any other age. Active temperaments require more than sluggish ones. People in cold weather and in cold countries require more of the non-nitrogenous elements than people in hot climates. Huxley estimated the amount of food required, thus: Lean beefsteak, 5,000 grains = to 5-7 of a pound; milk, 7,000 grains = to 1 pound; bread, 6,000 grains = to 6-7 of a pound; potatoes, 3,000 grains = to 3-7 of a pound; butter, 600 grains = to 7-35 of a pound; water, 6 pounds.

Many experiments have been made to test the relative values of animal and vegetable foods. Though in practice there are no distinctive flesh-eaters among us, and very few strict vegetarians. A comparison is made between a meal made of equal weights of lean beef and potatoes, and one of equal weights of peas and pearl barley, such as were furnished by Count Rumford's soup house to the poor of Munich at a half penny a dinner.

It is shown that as compared with the beef and potatoes, the peas and barley meal furnished 40 per cent more of nitrogenous food, more than six and a half times as much starch, more than double the quantity of sugar, about 17 per cent more of fat, and only a little less of salts.

The great German scientific philanthropist states that he found that less than five ounces of solids was sufficient for each man's dinner. He was supplying more nutritious material than beef and potatoes, and therefore his five ounces were more satisfactory than a pound of beef and potatoes, which were three-fourths water, for which the buyer pays a good price per pound when he buys his prime steak. The nutritive value of the cereals and pulses (wheat, barley, oats, beans, peas and lentils) is as 3 to 1 when compared with meat and its economy as 18 to 1.

During the last few years experiments have been made on an extensive scale in different countries of Europe in order to test the cost, healthfulness and popular approval of a system of cheap dinners for the benefit of the national and board schools. Documents were furnished by Geo. Herbert Sargent of Birmingham, Eng., one of the chief promoters of the system, setting forth the results in various parts of Great Britain. Here is one of the illustrations: In the Kendal district dinners were furnished two country schools.

On Monday, Tuesday and Thursday soup and hash were served. Soup—5 pounds peas, 3 pounds barley, 2 pounds bones, ¼ pound beef drippings, ½ pound onions, 6 ounces salt, ½ ounce pepper. Hash—70 pounds potatoes, 1½ pounds onions, 8 ounces salt, ¾ ounces pepper, 3 pounds meat.

On Wednesday and Friday hash and pudding were served. Hash—49 pounds potatoes, 1½ pounds meat, 1 pound onions, 6 ounces salt, ½ ounce pepper. Pudding—17½ pounds flour, 1 pound lard, 2 baking powders, 4 pounds treacle or preserve, salt.

Single dinners were served for 1 penny or five for 4 pence.

These quantities were sufficient for 80 children each day in Birmingham, where 300,000 dinners are served in five months.

He says it has been found that two or three of our dinners a week, given throughout the winter to half-starved children in addition to what they could get before, would change them from a pinched to a fairly well-fed condition, fill them with life and spirits instead of dullness and misery. The popularity of the soups is tested in the simplest way. No compulsion whatever is laid on the children to finish what is given them. They are not pressed or even encouraged to eat more than they have an inclination for, yet we rarely find, as we often did when the dinners were far more costly, that anything is left.

Peas and lentils meet another distinct want. It has been noticed that children prefer something moderately solid. This legumes just supply; they retain enough hardness to want biting, but not enough to make them indigestible. They have further these enormous advantages; when one has once learned where to buy and how to cook them they are very cheap and give little trouble. Perhaps this does not apply here in the farmers' institute of Grundy county, but you remember my topic was food requirements of the body. I think some people consider food requirements of the appetite only.

Ladies, do you know I fear there are very few natural appetites left in this country. I fear most of us have acquired appetites that are not satisfied with plain, simple food. We hardly know we have dined unless we have our pie or pudding or sweets of some kind, and the trouble is they come at a time when we should stop, and are often that much more than we need.

Perhaps sometimes the fault is that the cook has not yet learned to cook the plainest food in an appetizing way. If it is thoroughly cooked perhaps it isn't seasoned. Or if it is well seasoned it needs a little more time in cooking to bring it to perfection. Or perhaps it has a scorched flavor, which is anything but delicious, owing to a minute's neglect on the part of the cook. There is no one in any employment who needs to be alert in every sense and faculty more than the skillful and successful cook, especially with a large family to cook for and small means and few facilities for doing it.

But no one seems to receive credit or praise for the well cooked, common ordinary every day dishes; it is only the unnecessary extras bring a smile of approval to the countenance of (there I almost said my lord) what a blunder that would have been in this Republican country. I meant of the man for whom pleasure and approval all that is done in the house is done.

The people in this world will be better and healthier and happier when the most important question of every day is not what shall we have to eat.

When people eat that they may live, and read, and study, and work, and enjoy life, and not live that they may eat, and eat, and eat, and wish for something different.

Elizabeth Harrison, of the Chicago Kindergarten college, says the Sabbath desecration, base ball, etc., and much of the lawlessness, which we deplore, has its origin in an improper training of the appetite of the little children, leading them always to self indulgence. Am I wandering from my text? to return: The body requires an abundance of wholesome food, thoroughly and carefully prepared and served neatly with an accompaniment of pleasant faces and cheerful conversation, needs to be eaten slowly; three meals a day and not a bite between meals.

EDUCATIONAL DEPARTMENT.

CONSOLIDATION OF COUNTRY SCHOOLS.

[By Alfred Bayliss, Superintendent of Public Instruction, at McLean County Farmers' Institute. Extracts from his address.]

ALWAYS FOR HOME RULE.

Nothing I shall say is intended to be inconsistent with the plain principle of home rule in each district, upon which our whole body of school legislation rests.

I speak only to those who assent to the following:

1. An up-to-date school requires (1) a good school house, (2) modern text books, (3) reasonably long terms of school, (4) trained teachers, and (5) expert supervision.

2. "Those who live in the fields are as deserving of education as those who dwell beside the asphalt." That is to say: A country school is entitled to as good a school house as a city school, to as much school, to as good teachers, to as careful supervision, and to as good a library and other accessories.

3. First-class work is worth as much, cost of living duly considered, ten miles from town as it is in the heart of the city.

4. It is economy to pay a public servant well, and then see that he does his work.

UNEQUAL OPPORTUNITY.

There is inequality of opportunity and waste of energy in the free school system of Illinois. There are in Illinois 12,852 school houses, 8,303 of which the county superintendents say are "comfortable and well furnished; 1,297 are admitted to be unsanitary or otherwise unfit" for their purpose; 965 last year enrolled fewer than 15; 433 fewer than 10, and 75 fewer than 5 pupils. There were July 1, 1901, (5,708 districts) 6,422 schools with libraries and 6,430 without, but this ratio has been materially changed since; (he thought that by the close of the school year three-fourths of the schools would have libraries.) There were 2,346 school premises without trees, 3,872 with insufficient shade, and but 2,802 ornamented and well kept grounds.

But there is an unprecedented movement, both in town and country, to improve the conditions. Of the 173 schools in Sangamon county 122 have made improvements the past year. A year ago last December only 194 pupils made application to take the examination for admittance to the high school. Last December 385 pupils made application for the examination. "There are others," and not a few of them.

IN M'LEAN COUNTY.

There are 276 schools in McLean county and 19,166 children of school age; 262 districts. There are 4017 boys and 4,375 girls (8,392) in the 35 graded schools and 3,153 boys and 2,904 girls (6,057) in the 240 ungraded schools. The 8,392 children in the graded schools went to school an average of 138 days and the 6,057 children in the ungraded schools attended an average of 108 days.

A BARGAIN?

There were 196 teachers in the graded and 259 in the ungraded schools. You paid to the 196 teachers $100,738.96 and to the 259 teachers $74,160.43. That is 196 teachers drew $26,578.53 more than 259 teachers. I do not account for this. (Perhaps it was a bargain to get 259 teachers for $26,578.53 less than the others paid 196.) There are 12 high schools in McLean county, having an aggregate attendance of 997 pupils and a total of 112 graduates. The year before 105 country pupils completed the eighth grade to the satisfaction of Superintendent Wren. If any of them attended the high schools, they probably had to pay tuition and live away from home in order to do so. In 1898 Mr. Wren reported 82 schools having libraries; next year there were 106 schools, the next 126 and the last 225.

These things—and the schedule could be extended—indicate that while there is no lack of energy, enthusiasm and devotion on the part of school officers and teachers, there is a lack of economy in administration, as a result of which the State is not everywhere receiving the fullest possible returns for the immense outlay for free education. There is an inequality of opportunity, which it is the duty of all of us to seek diligently to correct.

THE REMEDY.

In my judgment the consolidation of the schools in the districts most affected by the disintegrating processes alluded to, coupled with the free conveyance of the children to and from school, is the most practical and feasible measure yet proposed for restoring, approximately, equal free school opportunities to the children of the country schools. Happily we are not without reliable evidence of the efficacy of this remedy.

MONEY SAVED.

Massachusetts—The free conveyance of children to and from school has been in vogue in the old "Bay State" for many years. The expenditures for that purpose during the last decade have increased at the rate of $4,000 to $17,000 a year, and last year were $127,409.22. This is a fair measure of growth. The secretary of the state board of education certifies that: "The money saved by such consolidation pays in part, in full, or in full with something to spare, for central schools with better teachers, and for the conveyance of the children thereto."

ARRAY OF WITNESSES.

Professor Bayliss told of his visit to the consolidated schools of Ohio, and gave details showing the universal improvement and satisfaction that follows the adoption of the plan. He also quoted many reports from Indiana, showing that the results of consolidation in 40 counties were the same. In a number of instances there was considerable opposition at first and in every case this vanished when the plan had been tried for a time. After many interesting details and some excellent arguments dealing with the organized opposition to the school bills in the last legislature, Professor Bayliss concludes as follows:

THE OBJECTIONS.

Finally the objections to this plan may be summed up substantially as follows:

1. The natural conservatism in favor of the ancient landmark, and against any innovation. A sentiment to be respected. Society needs its balance wheels.
2. The socialistic objection—which carried to its logical conclusion would close the common schools entirely.
3. The depreciation of property which might follow the removal of school houses. Experience shows that it works out the other way.

4. The difficulty of securing conveyance. Experience shows that no trouble need be anticipated. The bidding for the work is lively, the prices moderate, the service perfect. Transportation protects health, conduces to comfort and eliminates tardiness.

5. Increased cost. The fact demonstrates the reverse. The per capita cost of education is invariably reduced. The actual expenditure is often reduced.

THE ADVANTAGES.

The advantages are self-evident. I have dwelt upon the comparative cost, because that is the first objection of the average man, and must be met before more important considerations can obtain a hearing. It is really a minor consideration until the cost reaches the reasonable ability of the taxing unit. The great advantages are:

1. Better school organization, permitting the classification, gradation and better instruction of the children. There is no doubt of this.

2. Better teachers. This has been questioned. It is self-evident. The same teachers would be more efficient under the changed conditions. Three or four teachers working together in the same building, help one another. They have the advantages which come from comparison, criticism and coöperation as well as those which follow the intelligent division of labor.

3. Better school officers. They would be better because they would give more attention to their business and because they would have some business to attend to. Think of a board of three directors managing the business of an alleged school composed of one pupil and one teacher. They could "run" it, of course, if they held together, for they would be in the majority. Cook county has 700 teachers and 815 school officers, and it keeps the county superintendent busy, very busy, to prevent the latter from working overtime. They buy too much "snide" apparatus, he says.

4. But better school officers would lead to more intelligent purchases and the schools would soon have the right kind of libraries, apparatus and working material. The grounds would be utilized.

5. The health of the children would be protected. There are no statistics to show how much illness is caused by the damp clothing and wet feet of little childeren who now walk to school through the mud and slush and rain and snow.

6. The older boys and girls would go to school a year or two longer and eventually the central school would grow into a country high school. There is no doubt about this. The day of the country high school is near at hand, and there are going to be within reach of the country boys and girls high schools, but colored and flavored with the activities of the farm instead of the factory and the counting room.

PROBLEM AND SOLUTION.

There, then, you have set down in detail a problem and a proposed step in the solution. It is more than a mere matter of school administration, a question of expediency, or the convenience of the county superintendent in visiting and supervising schools. It is part of a broad sociological problem, affecting city and country alike and equally. The interests of the producer and the manufacturer and the middleman and the consumer are mutual. One can not live without the other. If there is any difference in the adjustment of opportunities it should be in favor of the weaker, always. Every citizen is a factor in the State for or against the common weal and the common wealth.

Three generations measure the duration of the city family and then must come strength from the country. The law of self-preservation demands that the city, in the interests of its own life and health, shall recognize its reciprocal relations.

PLEA FOR PLOW BOY.

This is more than the question of keeping the boys on the farm. It is a question of justice, of fair and full and equal opportunities for all. It is a small matter on its face and at first thought.

This is my plea for the boy behind the plow. I say to you and to those who are more immediately responsible, let us give him a chance, as good a chance as the boy who happens to live in town.

The destiny of this great State, pregnant with possibilities beyond the fondest imagination of any of us, depends more upon the products of her schools than upon any other thing, and 36 per cent of all the children are in the less favored schools, working under the less favorable conditions. Let us give them, too, what they do not have, a fair chance.

ELEMENTS IN AGRICULTURAL EDUCATION.

[By Prof. F. H. Hall, at Jersey County Farmers' Institute, Dec. 19, 1901.]

I have heard of a man who planted dried apples and wondered to the day of his death why they never came up. They say that a certain book-farmer, having misplaced the volume in which the time for cutting timothy was given, allowed the crop to stand until the seed was ripe and scattered upon the ground. I have heard that the late Horace Greely paid $10 for two pigs, fed them $10 worth of corn, and sold them for $15. He made $5 on the pigs, but lost on the corn.

These and such as these are the stock "arguments" against book farming.

On the other hand, if every butter maker in Jersey county would read H. B. Gurler's book on dairying, and follow the rules there given, the increased value of Jersey county butter, in a single year, would be sufficient to buy a circulating library of several hundred volumes. If books will assist us in our work, if they will improve the quality of our products, then we want books. If farmers' institutes will do this, let us have farmers' institutes.

The experience of successful men is worth something. We'll buy it if we can get it cheap enough. I once made a trip to Davis' Junction. It cost me $7. I paid that for the privilege of going to school to Israel Boies for one day. Mr. Boies did not charge me anything for tuition. I got $50 worth of information—a clean profit of $43 in one day.

No man has any business to embark in any enterprise without availing himself, as much as possible, of the experience of other people. If farmers A, B and C have learned by experience that the flavor of onions injures butter, it is not necessary for me to cook onions in my milk room in order to learn that fact. If Billy Jones tells you that placing the moist tongue upon frosty iron does not produce a pleasant sensation, you will do well to take his word for it; don't try the experiment yourself. If scientific men tell us that "hollow horn" is a disease that originates in the minds of unlearned men, I shall hesitate before I allow an ignorant cow doctor to bore gimlet holes into the horns of my cow, and then further torture the poor animal by pouring into these holes a mixture of vinegar, pepper and salt. If scientific men tell us that "lampers" is simply a congestion and swelling of the fleshy lining of that part of the horse's mouth just back of the front teeth, and that on proper diet this will soon subside, I will not allow a "horse doctor" to bring the red-hot iron in contact with the tender sensitive tissues of the mouth of my horse.

If the educated veterinarian tells me that nearly all the so-called shoulder lameness is the result of defective feet, I shall hesitate long before I permit a Spanish fly blister to be produced upon the shoulder of my horse, simply because he is "lame in front."

What I learned about dairying many years ago by making Dr. Woodworth, Israel Boies, Isaac Wanzer, Cyrus Larkin, H. B. Gurler and Geo. E. Morrow my schoolmasters, and what I expect to learn on corn judging from Professor Shamel, and about breeds of horses from Dean Davenport, and about corn raising from Mr. Grout (he raised — bushels to the acre last season), and about feeding hogs from Mr. Rowe (his land planted to soja beans and fed to hogs paid him — per acre); what I have learned, and what I expect to learn, from these men and such as these, would cost me many hundred dollars to learn by experience.

Through the farmers' institutes, the farmers' bulletins and the better class of agricultural papers, much valuable information is being disseminated. But in the reception of this information, many of us find ourselves somewhat handicapped, because of a lack of such knowledge of elementary science as will enable us easily to avail ourselves of what learned men have to offer.

A most important question, as it seems to me, is, will the next generation, those who are now pupils in our rural schools, be any better prepared to understand the principles of scientific agriculture than were their fathers and grandfathers?

Are we doing all that we ought along these lines in the public schools of Illinois?

A few years ago I caused to be sent out to 100 representative men in different parts of the United States the following questions:

(A) Ought the public school work to be as helpful to prospective farmers, mechanics, manufacturers and merchants as it is to those who will become "professional scholars?"

(B) Is the public school work, as it is now mapped out in our best schools, equally helpful as a preparation for life work, to all classes who accept what is offered?

Nearly all to whom these questions were sent favored us with a reply. Almost without exception the first question was answered emphatically in the affirmative. The schools ought to be as helpful to the life work of one class as to that of another. A very large majority of those who answered these questions answered the second in the negative. Among those who thus answered were presidents of universities, teachers, lawyers, editors and bankers. Among the well-known men who answered the first question in the affirmative and the second in the negative were G. Stanley Hall, Charles DeGarmo, David Star Jordan, Ex-Gov. W. D. Hoard, Principal Robinson of the Chicago English high and manual training school; C. M. Woodard, director of manual training school, St. Louis; E. G. Keith, president Metropolitan National bank, Chicago; Franklin H. Head, Chicago; Judge Sylvanus Wilcox, Elgin; Milton George, Chicago, and Josiah Little, a banker of Amboy, Ill. Mr. Little added this statement in connection with his answer: "Any change in the public school work which will hold in school the boy or girl who may have in view other than a scholarly vocation, would be helpful. The main difficulty, it seems to me, is that the school life is too short."

This then is the key-note to what I have to offer. Keep the boys longer in school—the boys who are to become farmers, merchants and mechanics. But how may we keep them longer in school? There is but one proper way. Compulsory education will not accomplish the desired result. External pressure to move the boys toward the school houses and to hold them at their desks for five weary hours each day is not the panacea for educational ills. The great cure-all is better teaching.

But what is better teaching? It consists, in part at least, in making the school work touch the life work at more points. In this way, and in this way only, it becomes vi-ta-lized—vitalized. Says Dr. John Dewey: "There should be a natural connection of the every-day life of the child with the business environment about him, and it is the affair of the school to clarify and liberalize this connection."

The boy should never for a moment be allowed to think of his school as a thing apart from the activities of life. The good school is life and it is a preparation for life—for life tomorrow, next week, next year, next decade—life without end. But the youngster can only see it as a preparation for the life which is nigh unto him. His vision at first must of necessity be narrow. It is the affair of the school to extend his horizon; but not by ignoring the instrumentalities that are nearest to him. He must see things remote through, not over, the things in his own environment. The teacher must not expect the pupil advantageously to enter into the life of far-away poets and artists and sages, until he has entered into the life that is nigh unto him—into which he is born.

Few boys pass into their teens without some thoughts of a life work. The boy of 14 who has not such thoughts is abnormal. The promising lads, the ambitious lads, the boys who will at length become valuable members of society, who will become self-supporting citizens and able to contribute to the support of others, early learn to work to a purpose. If such worthy lads find in the school work that which they believe will be helpful to them in their prospective life work, they remain in school; if they do not find it, they go out. Prospective lawyers, physicians, journalists, preachers, teachers, easily and quickly see the relation of their school work to their life work; and they remain in school. Prospective farmers do not discover this relation, and they go out.

The manual training schools reveal the relation of the school work to the life work of the prospective mechanic; through manual training hundreds of boys are retained in school—Chicago English high and manual training school.

In a similar manner the boy who expects to become a farmer, a dairyman, a horticulturalist, will remain long in school if he finds in the school work that which has a substantial and vitalizing connection with his proposed life work. It is the affair of the teacher to discover and sieze upon these bonds of relation, and, in the words of Dr. Dewey, "to clarify and liberalize them."

It has been my privilege to make a twelve-year attempt at school work along these lines—an attempt to clarify and magnify and intensify the bonds of relation between the intellectual life and farm life. Many mistakes, no doubt, were made. The work was at best tentative. But of one fact a twelve-year experience assures me: Make the relation between knowledge-getting and success on the farm as apparent to the pupils as is the relation between knowledge-getting and professional life, and prospective farmers will be as eager for instruction as are prospective lawyers or teachers. From that twelve year experiment I learned more than this. I learned that the reading and the writing and the arithmetic and the grammar and the physics and the chemistry, may be made to touch the farm life at many points—that the work of a school, particularly of a rural school, may be vitalized, the interest of the pupils aroused to the very highest pitch and maintained for a long period, by establishing in their minds the importance of this connection of the school work with the farm work.

At the risk of giving to my address an egotistic coloring, I will tell you something of the details of this farm school experiment station which occupied 12 of the best years of my life from 1875 to 1888, with one year vacation.

COURSE OF STUDY.

Arithmetic—Arithmetic of the farm and of the workshop, corn crib, grain bins, potato bins, cisterns, hay in the stack, hay in the mow, distance traveled in plowing, 12 inch plow, 14 inch, 16 inch drag, mowing machine, hills to the acre (corn, potatoes), length of row to the acre, shocks of corn to the acre, trees to the acre (15x15, 20x20, 30x30), lumber problems, fence, cutting of rafters, tile.

Physics—Specific gravity, weight of lumber, stone, iron, wood, brick, new milk, skimmed milk, cream. Ice; cooling milk with ice; with water. Pumps—two-horse eveners, three-horse eveners; strength of joists.

Chemistry—(G. E. Morrow); elements of agriculture (by Waring); soils, potash, phos. acid, nitrogen; feeds, the balanced ration; cream pot, butter jar, bread making, vinegar barrel and of the silo.

Judgment—Weights of horses, cattle, hogs; live weight and dressed weight.

Language and History—Goldsmith's Maid, Manley, Miles, Messenger.

Churning, cutting rafters, soldering, saw filing.

Our young people must be convinced that brains are as valuable to the farmer as they are to the teacher or preacher. The applied value of every subject taught in our schools should be made as apparent as its scholastic value. The young people should be made to see that all honest labor is honorable, and that, to make it pleasurable, the heart and the intellect must be in the work. When head, heart and hand work together, no matter what may be the vocation, the days are never too long. In one of the best counties in the State I learn that the farmers have adopted the eight hour plan—they work eight hours in the forenoon and eight hours in the afternoon. Indeed I doubt not that the most successful men before me have followed this plan for many years.

The curse of the world is not long hours; it is joyless labor, and joyless labor is transmuted into joyful labor when the mind and body work together for the attainment of some worthy aim. The "man with the hoe" is not an object of pity. He is not of necessity a specimen of degeneration, or of arrested development. The man with the hoe may be a happy, growing, self cultured man. This he will be if he hoes with his head and with his heart as well as with his hands.

But we are confronted with a condition, not merely with a theory. The boys who expect to go back to the farm leave school before their own intellectual needs become apparent to them—before they are able to read intelligently the bulletins that are issued from time to time from our experiment stations. They have been doing this in years past; they are doing it now. What may we do to prevent it? I answer, teachers must be so trained that they themselves will be able to see the relation of the school work to the life work on the farm. Who shall do this?

There are now four normal schools in this State, costing the tax payers annually about $200,000. In the act of the General Assembly establishing the first free public normal school in this State occur these words: "The objects of the said normal university shall be to qualify teachers for the common schools of this State, by imparting instruction in the art of teaching and all branches of study which pertain to a common school education, in the elements of the natural sciences, including agricultural chemistry and animal and vegetable physiology."

Why not demand of the normal schools in this State (if such a demand be necessary) that specific work shall be done in "agricultural chemistry and animal and vegetable physiology," in accordance with the spirit and letter of the law that brought these schools into existence?

A move in this direction is already being made. I know from his address at the dedicatory exercises of the Eastern Normal school, that the late Governor Tanner approved of such a course. I have reason to believe that it will be favored by Governor Yates. I know from many personal interviews that such work in the normal schools would meet the hearty approval of Honorable Alfred Bayliss, State Superintendent of Public Instruction. To make it all the more effective it should receive the unqualified stamp of approval from the farmers of this Congressional district. Let those in authority understand that you expect the graduates of our State normal schools to be fully prepared to give elementary instruction in these branches, which touch so closely, and at so many points, the life work of large numbers of the citizens and tax-payers of this great agricultural State.

Chemistry of the drug store. Chemistry of the soil and of feeds.

But this is not all: There is a college of agriculture in the very heart of our State. There is a department of pedagogy there, too. Tell me, pray, why there should not be a wedding between these two departments of our State university? Why should not the offspring of this union go out into every county of the State, able to present in the most approved pedagogical manner, to our sons and our daughters, the elements of agricultural science?

A few years ago a large sum of money was appropriated for the college of agriculture. Commodious buildings are completed. The Forty-second General Assembly made appropriations (by far too small) for the advancement of the work at the agricultural college. Additional appropriations will no doubt be made by the Forty-third General Assembly. The farmers should insist that a part of this money should be expended in carrying the gospel of a better agriculture into the rural schools.

One other suggestion: The college of agriculture, it seems to me, should provide short winter courses for the young farmer. It may be presumption on my part even to suggest what ought to be done in one important department of our great universary, officered as it is by the ablest men whose services can be procured for this work. I desire to present this part of my subject, not too positively, and with becoming modesty. I can not escape the fact, however, that hundreds of young men have studied elementary agriculture at Madison, Wis., drawn thither very largely by the advertising that comes through the short winter courses in dairying, in sheep husbandry, in horticulture, and in other kindred topics, that have been provided.

WAGES OF GRADUATES.

I can not overlook the fact, nor is it best that I should attempt to conceal it, that at one time within a few years, more young farmers from Illinois were crossing our northern boundary to avail themselves of the advantages of the agricultural department of the University of Wisconsin and paying tuition therefor, as non-residents, than were attending the agricultural department of our own school at Champaign. I do not wish to say this very loud, and certainly not in a spirit of unfriendly criticism. I recognize the efficiency in most of its departments of the University of Illinois. I am cognizant of its wonderful growth in the last decade, and of its present prosperous condition. But would not the short winter courses, in the various subjects that would especially interest young farmers, result in a greatly increased attendance in the agricultural department, as it has done in Wisconsin? And is not such a result desirable?

The young and ambitious farmer can leave his home for six weeks in the winter and devote the time to study and experiment. If the course is what it ought to be, the next winter, perhaps, he goes back for 12 weeks and takes another young farmer with him. During the remainder of the year he is at his home; but he reads twice as much as he otherwise would have done, and he can not hide his light. His greater interest in agricultural topics is almost certain to result in the organization of the young farmers of his neighborhood, and these organizations will in turn favorably affect the district schools; and the schools will thus be brought into touch with the college of agriculture, and in the course of time will send pupils there—not for the six weeks' course, but for the two years' or the four years' course.

My statement in this connection would be incomplete and unjust did I not say that some work of this kind is being done at Champaign. To some extent "short courses" are offered under another name. The corn growers' and stock men's convention at the University of Illinois, and the stock-judging of the last two winters, have taken many young farmers to the university. It is believed that this movement will in some measure contribute to most desirable results—that it will greatly aid in interesting the young farmers of this State in scientific agriculture.

I state with pleasure, too, that the course of study for the rural schools of Illinois now contains eight pages of outline matter that is agricultural in its bearing. This matter was prepared by Dean Davenport, and will certainly prove of some value. The great difficulty is that but few teachers know how to use it.

It is worthy of mention, too, in this connection, that Mr. C. M. Parker, publisher of School News, is issuing monthly for use in the rural schools most valuable leaflets prepared by Professor Shamel. But such important work as this should not be left to private enterprise. Here, as in New York, these matters should be pressed upon the attention of the teachers at public expense, to the end that they may in turn be able to help their pupils see the relation of the school work to life on the farm.

But the machinery is in motion. A healthy public sentiment is being created. The farmers' institutes, the conventions, the college of agriculture, the State Department of Public Instruction, the teachers' journals, are each and all contributing to some extent to the dissemination of most valuable agricultural knowledge. Let the good work go forward, and let every farmer in this congressional district throw his vote and his influence upon the right side of every important question bearing upon this subject.

The needs of the young farmers were never more apparent than now. There are at least 59 agricultural experiment stations in the United States. Employed in these as directors and assistants are many of the best practically scientific men in the country. These stations are sending out hundreds of bulletins, in which may be found most valuable and practical information bearing upon every department of agriculture. The United States department of agriculture issues regularly the Experiment Station Record, 12 volumes having already appeared. These are sold at $1 per volume. Farmers' bulletins are issued by this department, in which the most practical parts of the work done at the experiment stations are presented. These bulletins are distributed gratuitously. You can have them for the asking. But from the very nature of the case many of them are scientific and somewhat technical. If our young farmers are to get the benefit of these publications, they must do such preparatory work as will enable them to understand the language of the scientific and practical men who write these papers. To illustrate: How many of our young men who leave our rural schools and go to the farms, are prepared to understand and apply the information that may be found in this bulletin?

In conclusion, I wish to say that there are two theories of education. These have recently been strikingly presented in an article from the pen of Prof. G. W. Myers of the Chicago institute.

According to the first theory, the man should be so educated that he will be something—that he may live in the enjoyments of the higher intellectual life.

According to the second theory, the man should be so educated that he will do something—engage in useful activities—contribute something of value to community life.

The first theory would have the student get culture for culture's sake—study art for art's sake. It would make its devotees able to recognize, to appreciate, and to enjoy the beautiful and the true in literature and in art.

The second theory would measure its men by the value of their performance—by their ability and willingness to do work that needs to be done. This work may have reference to things material, intellectual, aesthetic, ethical or spiritual.

The first view, says Professor Myers, "makes the consummate flower of education a mental state, in which the consciousness of individual self-sufficiency is unruffled by the struggles and sufferings of the race." It gives a man "poise, serenity and contemplative delight."

The second view would make emphatic the statement of the late Governor Russell that "The mission of education is not contemplation, it is service." It would make apparent the profound philosophy in the marvelous paradox, that one must lose his life in order that he may save it.

It is my belief that most of us will be willing, with Professor Myers, to accept the second of the two educational theories; and that we will henceforth regard that man as well educated who earns more than he consumes; who contributes to community life, and to community enjoyment, more than he expends upon himself; and that man as best educated who contributes most to the well-being of the race.

One who consumes more than he earns is a parasite. One who earns more than he consumes is a public benefactor, and this is true, whether he earns with a spade and lives in a hovel, or earns with a pen and lives in a palace. Hence, there can be no mistake in the advocacy of the idea that the school work should bear close and apparent relations to the life work, and that the aim of education should be efficiency in all relations of life.

"Any man is educated," says Minot J. Savage, "who is so developed and trained that, drop him where you will in the world, he is able to master his circumstances, and deal with the facts of life so as to build up in himself a noble manhood, and be of service to those that are about him. (There can be no noble manhood without service.) That is what education means; that is what it is for."

No matter what may be the nature of the work performed, only that it is valuable work. It may be done in the editorial chair, it may be done in the pulpit, at the bedside of the sick, in the school room, at the throttle of a locomotive, in the store, or on the farm. As William Hawley Smith says, "That man is educated who is onto his job," and who can hold it by virtue of the value of his services. The true worth of a man, be he ditcher or preacher, farmer or mechanic, capitalist or laborer, can only be expressed in terms of service.

Let us educate, then, in the rural school, and everywhere else, for service. Let the relation of the school work to the prospective life work of every pupil be made apparent to him, whatever occupation he proposes to follow. When this is done the school will be equally helpful to all classes of people.

THE BEST THING ON THE FARM IS THE FARMER.

[By Joseph Carter of Champaign.]

Of all the common relations of the farm, the cattle, corn, hogs and various parts and various things, the best thing is the farmer. He has taken the rugged plains, the sickly swamps, and tilled the land; he has rid the land of the snakes and vipers, and killed the disease germs; he has subdued the land, the water, and the air, and it has brought to him health and wealth.

By a farmer I mean one who lives on a farm, whether he tills his crop in two months, or one year, or several years. From the butter-maid to the housekeeper they are all farmers, and they are the people who feed the world.

When they are prosperous, long railroad trains stretch from one end of the country to the other; the ships are burdened with the produce for foreign lands, and the machinery of the factories has a busy hum. If the farmer should stop his work, the ships would rot in the docks and the railroad trains would stand idle in their sheds, the factories would close their doors and the world would go back into a life of desolation and ruin. As Atlas supported the world, so the farmer supports the world.

The leaders of our country were all farmers. Lincoln, the rail-splitter, and the other 26 presidents were all farmers except seven. When the devastation of war was on the country, the men who were at the front were farmers. The battle of Concord, which echoed its fire around the world, was won by the sturdy farmer.

The farmer is the only man who has that true-hearted love for his fellow being, because in him is the only class in the world in which there is equality. That is why men have become great. They were masters over large-hearted men because they had associated with them and had learned to be masters over them.

Then, too, physically the farmer is the strongest in any trial for endurance or strength. Physical instructors all over the country have found the greatest strength has been among those who earn their living in the pure and open air of the country. When a farmer feels sick he goes to work in the field and soon forgets about it, while the city man complains and goes to bed and calls the doctor.

The farmer of today is different from the farmer of 50 years ago. Today he must have business ability in connection with a thorough knowledge of all the seasons, of grains and fruits. Years ago the farmer produced all the food used by his family, made the implements, and there was little or no money exchanged. The farmer of today sells everything, and buys everything which he needs. To be a success he must be a good farmer, a good business man, and a hustler above all things.

A WEAK POINT.

The country schools as now organized are the weakest point in the average farmer's life. The schools should comprise a course in housekeeping and in every branch that is needed to make a successful farmer. They teach everything else but that. They teach them literature and arithmetic. What good will they be to the farmer? Let the little lot in the back of the school be cultivated into a garden, and let the teacher show the pupils from experience the way the vegetables are grown and how to successfully plant and raise them. And let there be planted a little orchard, with plum trees, apple trees, cherry trees, etc. Let the pupils graft and draft and study the nature and habits of the trees. Take the little bug from the tree and study him closely. Find out his nature and dissect him and find out if he is an enemy or a good to the tree.

If it becomes necessary take an extra hour to the day out of the school and take the children into the field where they can see the planting of the corn and the sowing of the oats; tell them about it and let them form an opinion. Take the clover by the roadside and study the nature of the flower, dissect its petals. Get the pupils a book on botany, books on plant breeding, on soil, on milk, on produce, on agriculture, and on farm animals. Teach the little girls the beauty of home and how to feed and clothe the household. When you reform the household you will do more to lift the generation and work reform than any method which has been tried for a century, and yet there is not in all the counties of this State one school which teaches the culture of the homes.

COMPLETE MEN.

The farm is the only place where complete men can be raised. It is the only place where they can from boyhood be trained to work, and if a boy is not trained to work when he is young he will never find work a pleasure. The farmer is the happiest man at work in the whole world and it is because he finds work a pleasure being taught from childhood and in his work he feels himself a free man. Every man on the farm is on an equal. All eat at the same table, sleep in the same house and pray at the same church. When a farmer dies the country people from miles around come to pay their respects. They come in wagons, buggies and carriages, while in the city there is only the few of the near relatives who come with long faces and haul you out to your last resting place. The wish of my life is to die in the country where the good old farmers would come in their wagons with chairs in them for seats and bury me in a plain, pine box which was not made by a trust. When their prayer was offered up, it would sail to my Father in Heaven. I would indeed feel that there was some one who loved old Joe.

Let the children study in the school the things which nature has spread about them. When the first robin of the season chirps at the window of the little school every pupil should have a thrill of delight and jump from their seats in merry glee.

Let the pupil learn of the insect enemies and find the way and means to exterminate them. Tell him of the fly and the mosquito and the chinch bug which has done so much in the late years to ruin the crops of the farmer in this vicinity.

Teach the pupils of the animals on the farm, the cows, horses and sheep. Some who are neither students nor casual observers do not notice the growth of the mind in the animal. When a little colt is born the first thing to do is to make it attached to you and to let it fear nothing. When it is born it will fear nothing and as long as you can keep it from being scared so long will it be impregnable to all noises or objects. When you train the animal start when he is a colt and when he is a few days old let him be haltered and led about the place, but by all means do not let him become afraid of you. Each animal, the same as man, has a nature peculiar to himself. A cow which has been accustomed to be milked by one person will not submit to any one who comes along. A vicious and ugly man who tries to conquer a cow which has been taught the true lesson of obedience from a kind master will not succeed. Experiments have proven that a gentle cow will give the largest quantity and the best milk. To have success in milking a cow you must have the confidence of the cow. When two cows which gave the same amount of milk were brought into a stable and one treated in a kind way and the other kicked and cuffed, it was found that the one which was mistreated did not give three-fourths of her usual amount of milk and when she died a few months later it was discovered that she had held her milk back. The first half pint of milk which comes from a cow is considered as poison, and all those who feel the necessity of the good of their health throw that away. That half pint or so is all the milk which is contained in the bag of the cow, the rest being secreted. Therefore if the confidence of the cow is not with the milker she will not secrete her normal supply, and the stronger the confidence of the cow the greater the quantity of milk.

When the farmer boy is taught the good there is on the farm and the opportunity he has the tide of the country boy to the city will soon cease, and the result will be better farmers, better products and the country will be bettered.

In the morning when the average child comes from his home to the school he is all saturated with the love of nature and nature's ideas. Then is the time to fill him with the story of agriculture. It is a pity we are so blind to the beauty of the soil and the land which can be found on the farm and the very things which will make us the highest education; and when we open our eyes to the brightness of the things about us we will see the best on the farm and the farmer will be the best thing on the farm.

FARMERS' CLUBS.

[By D. H. Zuck, Mt. Carroll, Ill.]

In a small, one-roomed building in the township of Salem, this county, is the scene of a pleasant meeting, at least once a month the entire year around.

It is the custom, on stated occasions, for the neighborhood to turn out in a social way, spend an evening with a short program, by way of entertainment, with quite a liberal allowance of practical talk and instruction.

This is the sort of meeting or society to which the committee on program for this county institute refers in asking for a paper on Farmers' Clubs.

This one is, we believe, the only Farmers' club in the county, and is known as the "Salem Farmers' club."

Although this is the day of much talk and speculation on union of capital and union of labor, we would not have you entertain the least suspicion that this club is a trust or combination of farmers over there in Salem that intend to monopolize farming, or get a corner on any of its products; but rather a conference, or council of people, all of whom are in some degree connected or interested in farming; for the purpose of discussing those important questions under which discussion, that decision may be reached, that shall make the farm more productive; make the necessary labor of the farm easier and more efficient; make the laborer more contented in his noble calling and arrive at conclusions which shall tend to the improvement of the social, mental and moral condition of the community.

The aim of this Farmers' club may be best set forth in the repitition of the second section of its constitution, which reads: "The object of this organization shall be the social, mental and moral improvement of its members and the material improvement of the community."

It is not the purpose of the writer to say much about Farmers' clubs in general, but rather to speak of the Salem Farmers' club as it presents itself to him.

As intimated the meetings of this club occur once a month and they are arranged so as to come on moonlight evenings, thus making the trip to and from the meetings both easy and pleasant.

A president, vice president, secretary and treasurer were elected at the organization of the club and committees on program, etc., are appointed.

The running expenses are so trifling that an occasional hat collection will meet them all.

Anybody may become a member under section 4 of the constitution which reads as follows: "Anyone in sympathy with the object of this organization, and willing to do what he can to promote its usefulness can become a member by having his name placed on the list of membership."

The program committee are appointed far enough in advance so that they can be able to announce a program at the meeting prior to its rendering.

If it is hard to get enough home talent, it seems easy to secure some one from a neighboring town to complete a program.

A doctor or a lawyer will be glad of an opportunity to get out into the country and with a little side help like this, a nice program can be given.

We think a Farmers' club would be just the thing for any community, and we are sure that many would be organized if people just knew the value and benefits derived therefrom.

I just now think of a club that out of a very meagre beginning grew to be an attraction to settlers 10 to 15 miles distant. An additional room with stage was added to the little school house in which the society met. A large library was collected and no one can estimate the good and lasting influence that was the result of those meetings.

This club was organized in a western frontier and meant brighter minds, an awakening of an intellectual spirit among its members and the forging of that sparsely settled country into a social unit.

If a club is to be formed, make your meetings as informal as possible, so that everyone will feel perfectly free to talk on any subject.

Secure a free State library as it will add much to the attraction of the meetings.

The State is ready and willing to send out a small library, enclosed in a nice case, and with no expense to those receiving it, except express charges from Springfield, Ill., and return.

A list of books may be obtained from Mr. A. B Hostetter, State Secretary of Farmers' Institute, whose office is at our State capitol, and by filling out an application stating your selection of books, etc., and returning same to him you will receive a fine collection of books which will surely prove attractive to your meetings.

A benefit we might mention in a meeting of this kind is the self confidence and ability one gets to speak in public, which comes from actual practice, in saying what we want to in the presence of an audience.

Another nice feature of such a meeting or society is its social side. Friends and neighbors have a chance to meet and have their friendly chats which could not very well have occurred had there been no society. Sociability is one of the strongest ties to friendship. I hope with these few thoughts that some club may be induced to form.

THE HIGH SCHOOL AND WHAT IT CAN DO FOR YOUNG PEOPLE.

[By Stanley Brown, Joliet, Ill.]

The public high school is one of the few purely American institutions that has preserved its right, unfettered, to be called a democratic institution.

It was organized in this State by the section of the constitution providing for the maintenance of an efficient system of free schools.

The growth in popularity and the almost universal support in money, in loyal sentiment and pride felt for this public institution, have been hitherto unknown in the history of education.

So far as this educational plant is concerned, the history of education as it is gleaned from that of the world, does not record a single instance in which a free people have freely and uncomplainingly expended such an amount as has been spent here for the free education of the youth.

To the young men and women of the city and town an urgent invitation is given to come and receive at public expense such an education, such a preparation for life as more than two-thirds of our presidents did not receive; such an intellectual awakening as Harvard college, the pioneer of higher education in this country, could scarcely have given half a century ago.

When Dr. Belfield of Chicago said, "Send the whole boy to school," he startled the educational world. Today we all admit he knew the right thing and we have been until now reaching the point he passed 20 years ago.

Develop the intellect only and you may produce a physical and psychical dwarf; develop the soul or body at the expense of the intellect and the result is equally unsatisfactory.

The social, moral, physical, psychical instincts must develop synchronously if the ideal citizen is to be the result.

The social nature receives some attention in the daily intercourse of pupils with pupils and teachers, in class meetings and class parties. This is in the concrete. In the abstract, by an occasional lecture on Assembly day, or a series of university extension lectures.

The moral nature is cultivated by hearing the reading of the scriptures, by daily admonition to right conduct, in the inculcation of honesty and truthfulness; by teaching of good literature, by the occasional lecture on Assembly day, and most of all by the power of the pure and upright lives of the teachers as they continually appear before the students.

The physical well being is provided for in various kinds of sports such as basket ball, base ball, foot ball, bicycle riding, gymnastics, and by the walking to and from school. The two session plan is in this particular much preferred to one session.

The psychical nature is developed incidentally by contact with one another and by study of books on psychology and ethics, by study and observation of human nature. But here as before, the greatest and most influential force is the power in the teacher to impress his own personality upon his pupil.

If, then, an opportunity in the high school for the development of the intellectual, physical, psychical social, moral natures of the youth is presented, an ideal long sought in education is at hand, and it remains only to develop the school along these lines until its greatest usefulness shall be manifest. The physical, the social, the moral, the intellectual, include all characteristics in the child. When we have made provision to train these we do educate the whole child.

The high school stands preëminently for something positive, definite, accurate and sane. Its curriculum has always presupposed the pursuit of a few subjects, with such intense application as to give the student information, culture, ability to think accurately and quickly, self control, and such an intellectual grasp of the subject as would give him power to stand firmly and answer without embarassment any rational question touching the subject pursued. The men of positive character have done in all lines of work the most to bring order out of chaos and progression where both stagnation and retrogression existed before. "In all the schools," says Dr. Draper of the University of Illinois, "we need to teach fewer things and teach them better." This means, do not give the child so many subjects that he becomes absolutely mystified from day to day to know which to study.

No education is worthy of the name if it does not provide for and insist upon honest struggle with difficulty. We talk of educating for life. God grant that we may never educate for death; for if we teach the citizen how to live, he will always know how to die. Well may we say educate for life and for the kind of life met on earth—*i. e.*, a life of struggle. Did any life mean anything unless there was in it struggle? We hear much of taking away the difficulties in education and spreading the energies of the child over six or eight different subjects in a year, when he ought to have three or four. In the first instance the boy gets a mass of stuff but nothing definite. In the second instance he gets a few things and knows what he has done. He feels that his feet are on the earth while the former is in mid air with no directing power.

During the last 15 years we have heard fads in education condemned on every hand, but the high schools as a class have remained as the balance wheels in these great upheavals and have been free from the charge of fads. Notwithstanding this, the high school attendance has increased enormously and the school itself has grown in the public's knowledge of it and in public approval.

What the high school can do for young people is related in some measure to what it has done. More than half of the force of city teachers are graduates of the high school; they are also found and known prominently among the professional men of the city, while you can scarcely go into any part of the city and not find a high school student working in the shop or store as assistant, as clerk or in some similar capacity. So we say the high school does prepare for actual, practical life.

That the education of the schools unfits for life is never asserted seriously by one who has himself had the education of the schools, because he knows better. It ought not to be expected that the farmer's son who completes his school course will go back to the farm to work at the same wage he received before he went to school. He has multiplied his earning power and must have a fair return for his earning capacity. Students have gone from this school during the last year to the State University to study agriculture, to Cornell to study engineering, to Michigan University to study law, to the Northwestern to study medicine, to the Chicago University to study literature and arts, to Yale to study law, to Wellesley to study art and letters, to Pennsylvania to study finance and economy.

All these had their first and most important preparation for life right here at home and at public expense. Cook county is sending six young people to this school this year. DuPage and Grundy counties are also sending students, while nearly every village, town and postoffice in Will county is represented in the body of students. These young men and women come from Wilmington, Plainfield, Lockport, Elwood, Braidwood, New Lenox, Marley, Beecher, Manhattan, Lemont, Wilton Centre, Frankfort, Morris, etc. These young people rank well as students, and are to be relied on in emergencies.

When we consider that no effort has been made to secure students here and that the enrollment this year reaches 700, and that almost 300 of this number are boys and young men, we feel that much has already been unconsciously done to satisfy high school centralization.

'I say without fear of successful contradiction, that if any village or town in this or adjoining counties is situated so as to be easily accessible to a railroad or trolley line passing through Joliet, that such town or village can send its young people who are ready for advanced school work here at 60 per cent of the cost of maintaining such work in their own village or town and get this instruction, too, at the hands of a corps of teachers equal in efficiency to those of any high school in this State, and in a building whose equal in arrangement, equipment and general utility the world had neither known nor seen two years ago.

The high school can do much to teach habits of work. More students fail in their work from a lack of application than from any other cause. In their previous year's work their sum total of intellectual energy is expended on six or eight studies when it ought to be expended on three or four. The notion of making school work play is a great mistake if school work is a preparation for life. Life is not all play. Mr. Cooley says: "While it may be true that all work and no play makes Jack a dull boy, it is likewise true that all play and no work makes Jack a mere toy." Let the child select a few studies and pursue these long enough to know something definite, accurate and certain. Let him not be a reed shaken by the wind, but rather an oak sending its roots deep, and able to stand against buffeting.

The life directing power exercised by a superintendent of a large school is something rarely mentioned in school meetings and yet it is mainly by this kind of work that we learn to know the student so that we can be of greatest service.

In this kind of life direction, it often becomes necessary for the student to lay open his whole life's plans and projects; to mention hindrances, obstacles, time necessary to accomplish work, means at hand and how to secure more. A young man enters the private office and after a brief interview we learn his ambition is to become a lawyer, another a dentist, another a physician, another a civil engineer, another a teacher of Latin or history, another a chemical engineer, another an ad. writer, another a minister, another intends to prepare for the diplomatic and consular service. Young women looking forward to becoming teachers, lawyers, doctors, pharmacists, architects, etc., come in also. For each of these a different kind of preparation is prescribed and the requirements of the school to which they go must be met. This means constant and careful supervision; almost endless correspondence but ultimate delight to the student and parent when the former is safely entered on his higher course at some famous institution.

A different kind of advice, direction and counsel is needed by the most young people, whose preparation for life's greater struggles and responsibilities ends with their high school career. If the young man or woman is to become a stenographer. typewriter or bookkeeper, the line of preparation is clear and unmistakeable. but if we know that the young man is to go directly into his father's business, the advice as to what studies to pursue is not so readily determined. Among the things heard, aside from the routine work in oral expression, are business letter writing, commercial spelling and business forms, politeness on all occasions. Your employer's interest must be yours. If you get $25 one month be sure to earn $30 the next month. Be prudent in not thinking too much of promotion. A cheerful disposition, a neat personal appearance, a pleasant greeting, will often make both a sale and a friend of your patron. Do at once without question or comment what your employer requests. Rarely will you be required to do anything against your own moral principles.

Touching this whole question of honesty, obedience, accuracy, etc., I think there is nothing better than Hubbard's "A Message to Garcia." I quote, "When war broke out between Spain and the United States, it was very necessary to communicate quickly with the leader of the Insurgents. Garcia was somewhere in the mountain fastnesses of Cuba—no one knew where. No mail nor telegraph message could reach him. The president must secure his coöperation, and quickly. What to do? Some one said to the president, 'There's a fellow by the name of Rowan will find Garcia for you, if anybody can.' Rowan was sent for and given a letter to be delivered to Garcia. How the fellow by the name of Rowan took the letter, sealed it up in an oil skin pouch, strapped it over his heart, in four days landed by night off the coast of Cuba from an open boat,disappeared into the jungle, and in three weeks came out on the other side of the island, having traversed a hostile country on foot, and delivered his letter to Garcia, are things I have no special desire now to tell in detail.

"The point I wish to make is this: McKinley gave Rowan a letter to be delivered to Garcia; Rowan took the letter and did not ask, 'Where is he at?' By the Eternal there is a man whose form should be cast in deathless bronze and the statue placed in every college in the land. It is not book-learning young men need, nor instruction about this and that, but a stiffening or the vertebrae which will cause them to be loyal to a trust, to act promptly, concentrate their energies; do the thing—'carry a message to Garcia.' General Garcia is dead now, but there are other Garcias.

"No man, who has endeavored to carry out an enterprise where many hands were needed, but has been well-nigh appalled at times by the imbecility of the average man—the inability or unwillingness to concentrate on a thing and do it. Slip-shod assistance, foolish inattention, dowdy indifference, and half-hearted work seems the rule; and no man succeeds, unless by hook or crook, or threat, he forces or bribes other men to assist him; or mayhap, God in his goodness performs a miracle, and sends him an Angel of Light for an assistant. You, hearer, put this matter to a test: You are sitting now in you office—six clerks are within call. Summon any one and make this request: 'Please look in the Encyclopedia and make a brief memorandum for me concerning the life of Correggio.'

"Will the clerk quietly say, 'Yes, sir,' and go to the task?

"On your life, he will not. He will look at you out of a fishy eye, and ask one or more of the following questions: Who was he? Which encyclopedia? Where is the encyclopedia? Was I hired for that? Don't you mean Bismark? What's the matter with Charlie doing it? Is he dead? Is there any hurry? Shan't I bring you the book and let you look it up yourself? What do you want to know for?

"And I will lay you ten to one that after you have answered the questions, and explained how to find the information, and why you want it, the clerk will go off and get one of the other clerks to help him try to find Garcia—and then come back and tell you there is no such man. Of course I may lose my bet, but according to the law of the average, I will not.

"Now if you are wise you will not bother to explain to your assistant, 'that Correggio is indexed under the C's, not under the K's,' but you will smile sweetly and say, 'Never mind,' and go look it up yourself.

"And this incapacity for independent action, this moral stupidity, this infirmity of the will, this unwillingness to cheerfully catch hold and lift, are the things that put pure socialism so far into the future. If men will not act for themselves, what will they do when the benefit of their effort is for all? A first mate with knotted club seems necessary; and the dread of getting the bounce Saturday night holds many a worker in his place.

"Advertise for a stenographer, and nine out of ten who apply can neither spell nor punctuate—and do not think it necessary.

"Can such a one write a letter to Garcia?

"'You see that bookkeeper,' said the foreman to me in a large factory.

"'Yes, what about him?'

"'Well, he is a fine accountant, but if I'd send him up town on an errand, he might accomplish the errand all right, and, on the other hand, might stop at four saloons on the way, and when he got to Main street, would forget what he had been sent for.'

"My heart goes out to the man who does his work when the 'boss' is away, as well as when he is at home. And the man who, when given a letter for Garcia, quietly takes the missive, without asking any idiotic questions, and with no lurking intention of chucking it into the nearest sewer, or of doing aught else but deliver it, never gets 'laid off,' nor has to go on a strike for higher wages. Civilization is one long anxious search for just such individuals. Anything such a man asks shall be granted; his kind is so rare that no employer can afford to let him go. He is wanted in every city, town, and village—in every office, shop, store, and factory. The world cries out for such: he is needed, and needed badly—the man who can carry a message to Garcia."

In order to know how to direct young people, lend them sympathy and advice, and enjoy their implicit confidence, it is necessary to know where they live, what their home life is, how much encouragement they receive at home, whether their parents take a personal interest in them and really know their work in school, whether they do work out of school, what their social life outside of school is, etc., almost ad infinitum.

With all this information it is often possible to hold the student up above the standard of life in his own home; the school administrator thus becomes a kind of educational physician, a private counsellor, a guardian-at-large of the young person's future career. This service which lifts up, helps on and tends to keeping right the life of the individual is of much higher order than that which looks to mere money getting and is never paid for except is similar service.

To recapitulate: (1) The high school is the people's institution, it is for all the people of the city and all the people of the town. (2) The high school welcomes to its varied undergraduates' courses, young people from surrounding towns and from the district schools when they have fairly done the eighth grade work as prescribed by the State course of study. (3) The high school welcomes teachers, high school graduates, and others holding grade certificates to the graduate courses in pedagogy, psychology methods, etc. (4) The high school prepares students for real, active, struggling life, and not for a fanciful, evanescent, unreal existence somewhere in the realms of terrestrial space. (5) The high school prepares for real, practical business life in which are exercised daily, ability to spell correctly, write legibly and rapidly, compose a business letter whose meaning is at once clear, brief and respectful. (6) The high school provides a way for the development of the intellectual, physical, psychical and social natures of the youth. (7) The high school stands for a definite, positive, and accurate amount of work, and does not seek to negative everything without at least offering an alternative. (8) The high school provides an adequate means for the development of the whole child; it is seeking to become and is fast becoming an important centre in community life. (9) The high school is a daily example of what may be done in the assembly of the young people for the inculcation and development of patriotism, obedience to law and order, and respect for authority of all kinds. (10) The high school is now and must ever remain the brightest star in the constellation of democracy; it knows no creed, no sect, no race; but respects all and accords to all, the highest privileges extended to any.

NATURE-SCIENCE AND THE FARM CHILD.

[By John T. Galbraith, Carbondale, Ill.]

"Sober, industrious, intelligent, honest, cultured citizenship should be the result of public school training in the United States." To this comprehensive declaration of the National Educational association let me add the one word "home," and make it read, "Sober, industrious, intelligent, honest, cultured citizenship should be the result of home and public training in the United States."

Probably 75 per cent of all the boys and girls of the farm are destined to grow into men and women of the farm. Probably 75 per cent of the teaching in the home and country schools of Illinois leads away from the farm. I would not be misunderstood. The schools are good and the teachers much better, usually, than the pay they get. But it is only fair that if 75 per cent of these children are to remain on the farm, that at least 50 per cent of the instruction given in the home and country school shall be such as will develop sober, industrious, intelligent, honest, cultured farmer-citizens.

Nature-science deals with the simplest, nearest, commonest things imaginable—air, water, snow, ice, frost—and their work; rocks, the composition of soils, the use of metals and minerals used in human industries; common wild plants and flowers, garden vegetables and trees, their habits and conditions of growth; insects, birds and domestic animals, and the relation of all of these to each other and man—in a simple and reasonable manner. From the three kingdoms of nature, in which they are included and which they explain, come all our material wealth—food, clothing and shelter. Surely a knowledge of these things is practical and necessary to the farm child.

I cannot enter into a discussion of methods. I can but hint at them. These must be left to the loving parent and earnest teacher.

Let me take a simple and lowly illustration—the earth-worm. Earth-worms are not merely the original plowmen—they have brought about the condition of the earth's surface that makes other plowing possible and profitable.

Field crops, for the most part, grow and feed upon vegetable mold—the layer of warm, light, brackish earth resting upon the subsoil. Save by the grace of the earth-worm, vegetable mold would exist only in those places where dead leaves and decaying growths generally resolved themselves into their original elements.

The earth-worm, which may be described as an embodied appetite, eats everything—animal matter, green leaves and dead ones, twigs, leaf stalks, small stones and earth. The residuum of all he casts upon the surface at the rate, throughout pastures and garden ground, of some ten tons a year per acre. Continue the process a hundred years, or even fifty, and many inches of fine, friable, productive soil results.

Beyond all that, their burrows let down light and air into and through the subsoil. Sometimes the burrows run six feet deep. These burrows are plastered all around with finely chewed earth, and keep shape often long after they are untenanted. From the dead leaves, which make so large a part of their food, the worms excrete humus-acids which attack and help to dissolve the rocks buried in the soil. Thus the earth-worms not merely transform the soil chemically and mechanically, but add to the bulk of it, since soil of every kind comes originally from the disintegration of rocks. Further, many leaves dragged down into the burrows are only partly eaten and decaying furnish gases which permeate the soil and react upon its mineral element. Now, what has the lesson of the earth-worm taught the child? Natural history, you may say. Yes; but in a larger sense it has taught the principles of subsoiling, drainage, fertilization, soil composition and the need of light and air in the soil.

Let us leave the soil and take the living plant. Passing from the germination of the corn grain up through the interesting growth of the plant, all of which is wonderful, we come to the fertilization of the ear, a subject in which we have all been interested this year. Let us see what really takes place when the corn is fertilized. First, the tassel comes out and on some bright, warm morning its blossom, that is, the little yellow bodies called the anthers, within the husk of the tassel as we might say, open and hang suspended by a thin, thread filament and shake out the yellow pollen grains with which they are filled.

The ear has been getting ready for these pollen grains by sending out a silk for each grain. Each of these silks is split at the end, and all along this split portion are minute barbs, the mission of which is to catch the pollen grains as they fall and hold them until they can deposit the live germ. When the silks are ready for the pollen they also exude a viscid or sticky substance which aids in retaining the falling pollen grains. When the silk succeeds in retaining the falling pollen grains, the live element proceeds to travel down the silk until it reaches the grain, where it accomplishes its work. When the pollen has passed down the silk the end of the latter dies; its mission has been accomplished. But if the conditions are such that the pollen is not plentiful this silk will retain its life for many days. What has the child been studying here? Botany, you may say. Well, botany used to be a study of plants, dead; and the best botanist was the owner of the largest hay-mow of these dead plants. Now it is more and more a study of plants living, growing. You need not call it botany, but let the farm child study the corn plant, its growth and method of cultivation. By adding just one bushel an acre to the average Illinois corn yield it would make a difference of 8,000,000 of bushels in the crop, worth at this time not less than $4,000,000 to Illinois farmers.

Think of what it might be to increase the average yield from 38 bushels per acre to 50 or even 60 bushels per acre. In the light of the investigations of the past three years this is not an impossibility.

In 1898 the apple scab fungus alone cost a loss of $3,500,000 to the apple growers of Illinois. In 1900 the loss from bitter-rot reached $1,500,000, while the damage by injurious insects would be estimated at about the same figure. But the school children of Illinois, and even men and women, pass in blissful, if not criminal, ignorance the injurious insects and useful birds, all about them leaving the dangerous ones unmolested, while they maliciously, possibly ignorantly, destroy the birds with stones, sling-shot and gun. Not a study of insects and birds, dead, dusty, faded, silent, preserved under glass—entomology and ornithology, which has been chiefly a science of skeletons and stuffed birds; but simply nature study, vastly more helpful because a science of living, flying, singing creatures.

There are children who can, in learned and scientific language, if not in other languages, tell of the composition of the earth and the causes of its construction in the glacial period who can't tell the composition of the soil or its productive value on their father's farm or in the school district. There are other children who can tell of the products and characteristic plants of every country in the known world, but ask them what their father's farm produced this year, products in bushels and tons, or to name the trees, wild flowers or weeds native to their own farm or country, and how many could do it, much less state their value or harm?

These are not foreign things, but make up the environment of the farm child. The country is the children's paradise; to plant seeds and to watch them grow becomes the delight of children. Nature was designed to become our first teacher, for the first faculties that awake in our being are those that apprehend her.

In the country school more of the reading, and spelling, and writing can be learned from text books and objects having much to do with the child's surroundings. Any child will write ten times as much and ten times as well of the things which he knows and best of all it will be original. Better, vastly better, than a learned essay upon, "Beyond the Alps lies Italy" or "Ad Astra per Aspera" gleaned from other's thoughts. If one steps into the average country school and carefully notes the stuffing, cramming effort to make the child swallow the whole catalogue of learning these faithful teachers are expected to impart, it is no longer a mystery why ninety-nine out of a hundred go through this world with eyes seeing not and ears hearing not. But the child who begins naturally with the great, yet simple truths of nature about him—the field, the flower and the bird—will sooner or later strain his eye through the microscope in his efforts to penetrate their inmost secrets.

The first purpose then of the work is to interest the farm child in nature. The second is to train him to observe. compare and to express (see, reason, and tell); to cause him to form the habit of investigating carefully and making clear, truthful statements, and to develop in him a taste for original investigation. The third is the acquisition of useful knowledge.

I cannot see how any one can grow in God's sunshine and surrounded by the grandeur of his nature-world and be an infidel or an anarchist. Let us open the windows of our homes and school-rooms to Nature, and teach the little ones to admire and love her beauties, to use her joyfully and not to abuse her. The mind trained to observe life and living creatures will surely learn that the book of knowledge is the one volume which has no page upon which can be written "the end."

This is my plea for the farm child of Illinois. The farm girl, how much she means to the Illinois of tomorrow! May her heart be kept pure and true to her home in the country! May the Illinois boy become stronger, sturdier, more self reliant, more ambitious, more observing, more God-fearing, healthy all through physically, mentally, morally.

AGRICULTURAL AND EDUCATION.

[By Edward Grimes. before the Farmers' Institute at Raymond, Oct. 22, 1901.]

LADIES AND GENTLEMEN—Once again we meet in our County Institute. We welcome the occasion; it affords us pleasure to greet each other, to look into each other's faces and to exchange our views on the subjects of interest to our life work.

Our coming together not only bespeaks our interest in our occupation and our friendshtp for each other, but it also testifies to our desire for an increase of knowledge and thereby a better equipment for our work.

While we love sociability and look upon it as a very necessary and valuable factor in happyfying life, and while our coming together thus annually affords us great pleasure, yet we look upon these institutes as for a better and higher purpose than mere sociability and pleasure; they are not mere picnic occasions, they are mediums of education, and as such we should recognize and appreciate them.

The "ignorant clodhopper" of half century ago is no longer a fit representive of the farmer class; it is not so easy now to tell the tiller of the soil by his whiskers and the misfit of his clothes, we are not ashamed today to stand our representatives beside those of any other class of men our country produces; they will bear comparison in dress, manners and brains.

The farmer is no longer the butt and joke of the professional man; no longer the gullible dupe of the city merchant or the traveling sharper, he reads and thinks and investigates for himself. Go into any home in the country and you will find newspapers, magazines, books, market reports and other reading matter equal to any you will find in the homes of the merchant or professional man.

If any man thinks the farmer does not read and keep posted, especially on that which directly concerns him and his business, let him try to buy his stock or grain at a less figure than the market quotations, and he will very suddenly change his mind.

The farmer of today takes no back seat from any man in matters of education and culture; indeed it is impossible to measure at this time the far-reaching effect on society of the strides being made in farm education; certainly there is discernable in our large towns and cities a recognition of the claims of agriculture and of the influence of the farmer never before so manifest in social and business life.

A valuable work done by the agricultural colleges, the experimental stations, National and State departments of agriculture and the farm schools fostered and supported by private enterprise, and the County, Congressional and State Farmers' Institute is beginning to tell mightily on the masses and to change public opinion with reference to the life and work of the farmer.

Never was there a more wholesome respect for the art of agriculture than now, never less disposition on the part of city folk to engage in cheap railery at the "country jays," never did agriculture stand on higher ground in the matter of dignity or the employment of the best and brightest minds, never was there more profound admiration among thoughtful people for the atmosphere of the country which was common in the old days of Washington, whose words still hold good, "that agriculture is the most healthful, most useful, and most noble employment of man."

Never was there a time when so many men have been called from the farm into places of trust and power, indeed the farm is the cradle of nearly all the great men this country has ever produced.

Under these conditions it is not strange that the tide of migration from the country to the city is turning and men from the city are beginning to seek homes in the country.

The time will come when the farmer will have no trouble to find help to put in his crops and to gather them, for men will seek opportunity for the healthful outdoor exercise which farm work gives them, and no man will feel ashamed to be called a farmer.

Farm work is as dignified as any other kind of labor a man may be engaged in, there is nothing more healthful, nothing more honorable and nothing more satisfying in its returns. The only thing that is lacking today to make agriculture more attractive and respectable in the eyes of professional men, is to give it larger recognition in our educational system; the subject of agriculture has not yet received the recognition which it deserves in the educational field; it is one of the newer claimants in the educational curriculum.

There are many reasons why agriculture should be made a distinctive study in the education of our youth; first of all its value appears from the fact that it affords a means of livelihood. In the educational world we have been inclined to ignore or pass over lightly the things which savor of practical life, feeling that such subjects were out of the domain of education and culture; when God decreed that man should earn his bread in the sweat of his face it was not the result of anger or of ill will toward man but for the good of his physical and moral life.

Only by work do we grow. The mechanic is made at the bench, the teacher in the schoolroom, the painter at the pallette. No matter how thorough the preparatory training may be, true ability develops only in its accomplishment. Culture without work is as impossible as physical growth without food. Therefore, what we need in our education is the information and training that will fit us for the practical duties of life, those duties which come in the line of our special calling.

Such training is of vastly more value to the individual than all the accomplishments he can acquire for social life and pleasure. One lesson on the subject of agriculture properly taught is worth a half a dozen lessons in music and drawing, so far as practical benefits of life are concerned.

If our public schools would have a little more of the practical side of life represented in their curriculum of study and less of the veneer of culture, they would be far more successful in rendering help to the youthful mind and of laying the foundation for a useful life in the scholar; but I plead not so much for the elimination of subjects, which to my mind are unnecessary and valuless which are only fit for the purpose of show and polish, but for the introduction of more practical subjects and of sufficient time being given to the teaching of these to make them thoroughly comprehensive to the student. I am not saying what I do in a spirit of criticism, but merely as a suggestion and to give expression to my convictions concerning the importance of the subject of agriculture. I remark again that as a means of livelihood agriculture is an important subject and should find a place in our educational work to an extent greater than it does. It is work in which women as well as men may engage.

It is true that parts of the duties are too heavy for the strength of women, but it is also true that nearly every business develops beyond the ability of one person to manage. It is also true that one can hire common labor at a less figure than skilled workmen; where only brain and muscle are necessary the man can be hired at a less cost than where brain and skill are requisite, and there are always more such men seeking employment, so that a woman need not hesitate to engage in agricultural pursuits because parts of the work are hard for her.

Again, farming is a work that one may begin on a small scale and without much capital. To establish a manufacturing industry much capital and extensive plants with a large output are needed to insure success.

And then again farming offers such a variety of work. There is the opportunity for the flower garden, the raising of vegetables, the growing of fruits and the breeding of stock, all of which affords diversion and pleasure, to say nothing of the returns in money.

Just a word on fruit growing. This is a big subject and deserves a liberal discussion by itself, but I must say just a word in passing. We farmers as a rule do not interest ourselves enough in this matter; we are too easily satisfied with the quality and quantity orchards bear us; we are too careless of our trees; we do not prune them enough or cultivate the soil about the roots and replace the dead ones with live ones; too often our orchards are only pasture ground for our hogs and young calves, the ground covered with dead branches and old stumps. We can not have either good fruit or much of it under such conditions. Apples are our principal fruit in this country and there is no good reason why we should not raise the very best that grows. These can be made a very profitable product of the farm; they are easily marketed and usually bring a good price.

Of course I would not advise anyone to turn a good rich farm all into an apple orchard; but I believe that every farmer ought to raise all the fruit of all kinds that he needs for himself. All it requires is a little attention, and this need not interfere with any of his other duties.

I do not take much stock in the current stories of fabulous prices paid for apple orchards in different parts of the country. If they are true in any instance they prove the exception which men have attained under peculiar conditions and by those who have been long engaged and became experts in their line.

But to return again to our first proposition, namely, that agriculture affords means of obtaining a livelihood and therefore should find a place in our educational curriculum. I do not mean to be understood as saying that the study of agriculture should be so incorporated into the common school work that it would be obligatory on all scholars to pursue its study at school as they now do the study of reading, writing and arithmetic. I do not mean that it should be considered in any sense a fundamental in education; I only mean that ample provision should be made for its study that all might have the opportunity to learn about it, and especially those who of their own choice or the choice of their parents wish to study it.

Second, we argue in favor of education on the subject of agriculture for sociological reasons; many people have gotten a wrong sense of proportions; they have sought wealth and well-being away from nature, and have lost the the charm and influence which she is ever ready to shed about them.

Boys and girls have turned their steps cityward oftimes leaving the old farm to neglect and deterioration. This might be all right and pass without comment did they better their condition by so doing. In some rare instances they may, but oftener they do not.

Hundreds of toiling men and women in the dense centers of population know far less of life in the fullness of its enjoyment than they would away from those centers; the increase of poverty, wretchedness, dependence and the charity which necessitates, has become a source of greater alarm to the city than has the depopulation of its farms to the country.

Few adages contain more truth than one which says "distance lends enchantment." Only the glitter and brightness of city life is manifest to those who live in the country, while oftimes only the routine and toil of their own life seems prominent; the reason of this lies chiefly in our failure to see the things of interest within our reach.

No surer way of correcting this condition has appeared than the present nature study movement, the object of which is to open the child's eyes to the things of interest to be found on every hand. The boy or girl who becomes imbued with the love of nature, who obtains the key with which to unlock her secrets, is not likely to find the farm home irksome and monotonous.

Such a childhood leads naturally to a love for plants, and animals, and the outdoor life and to interest itself in the farm work, and such a love works mightily to hold the son or daughter on the farm.

So, too, an opportunity to learn something of nature is even more likely to excite interest in the city child and may arouse a longing for its gratification which will turn his steps toward nature's fields and flowers.

A quiet but strong force tending towards the correction of one great present sociological problem is thus at work.

Now in conclusion let me again express my pleasure at being permitted to meet with you, my agricultural friends, in this county institute, and allow me to urge you all to take a deep interest in these gatherings for the good you may get out of them individually and the good you may do—these institutes a medium of education, not only to ourselves, but also to the community and to the State.

The farmers are a power in the country, therefore let us see to it we not only retain this power but let us try to increase it by keeping posted on all current topics and by manifesting greater enthusiasm for our work.

Aberdeen-angus cattle on blue grass pasture, property of Israel Mills, Clay City, Clay County, Illinois.

FARM DEPARTMENT.

Profit and Loss.

[By Chas. Francis, New Lenox, Ill.]

Mr. President, Ladies and Gentlemen of the Will County Farmers' Institute:

It gives me great pleasure to be honored with a position on the program of this Institute, for the fame of the Will County Institute is known far and wide, throughout the State as the best.

This has largely been brought about by its able management, and clean cut principle of right and justice, and as long as right and justice are the predominating factors in any organization, it is bound to succeed.

Progression is essential to success, what we do well this year, we hope to do better next year. This is the spirit that has made the institute what it is.

For many years this organization has promulgated and carried forward principles calculated to benefit alll business pursuits, and we think the fruits of its labors are widely felt throughout the county and State.

Now, as I look into your intelligent faces, I see the stamp of réfinement of educated minds, representing prosperity, good government and happy homes.

This has not been brought about by mere accident or chance, but by work, by study, by close application to the different pursuits which you have chosen to follow.

I will not attempt to tell this intelligent audience anything new, but will try for a short time to present such facts that you all may know, and my purpose will be attained if I may say something that will be helpful and instructive.

My subject, "Profit and Loss" is old but ever new. From the earliest ages to the present day, these two words have been the subject of thought and consideration of men of affairs, men who strive to better their condition and make the world better. It should be the impulse of everyone to leave the world better than he found it. Our subject is one that covers a wide range of thought—as wide as the world. Every branch of industry is looking forward to a profit commensurate with the labor and capital employed. But is this always the condition? We say partially, for all conditions are not favorable for the best results.

As this is a Farmers' Institute, and the audience is composed largely of farmers and stock raisers, we will, for a little while discuss the farm as to profit and loss. There is just as much difference in farms as in farmers. You will agree to this as a fact. If a farm is to produce a profit in this time of close competition, it must have the best treatment that labor and science can bring to bear upon it.

No one will dispute the labor part on the farm; that is, there is never a lack of labor to be performed; but some one may question the science or scientific proposition.

One of the coming great political problems will be the harmonizing of capital and labor; one cannot long exist without the other.

The same relative forces must govern the farm for profit.

We have known men who are filled with theory on farm science; they can tell you all about the different soils, what they are capable of producing; they can tell you all about the different domesticated animals, and their relative producing qualities, and a great many other good things.

This is valuable capital, and is what every good farmer should have.

But of itself, it will not produce a bushel of corn, a bushel of oats, a pound of hay, or any domesticated animal. These can only be produced by labor.

Labor is the key which unlocks the store house of nature.

Therefore, a thorough knowledge of the science of farming, coupled with intelligent labor, should produce good results.

They are inseparable for profit. With either alone there is liable to be a loss.

When the intelligent farmer begins to take stock of his resources, his first thought naturally should be the condition of the farm.

Is it in the best possible condition? If not, why not?

Is it thoroughly underdrained or self drained? If not, you are liable to meet with a loss.

Look carefully to this. It will pay under all conditions, and will often divert what might otherwise be an entire failure, into one of profit.

We will next take stock of the fertility of the soil. If in a high state of cultivation, mark up a few points. If in a run down, worn out condition, mark down a few points; and it may go as low as zero under the last named condition.

To maintain and build up the soil is the part of science or good farming; to run down and deplete the soil of its crop producing humus is the opposite or reverse, and if long continued, the farm will become worthles as a money maker.

To maintain the fertility of the soil is one of the main adjuncts to successful farming.

This, in my judgment, is best brought about by a judicious rotation of crops, with thorough cultivation, with enough livestock to consume the greater part of all that is produced on the farm. This in turn will make valuable fertilizer to be returned to the soil.

Any piece of land after several years cropping should have rest, just as the weary body needs rest to repair its wasted energy. This can only be brought about by pasturing.

This rest will be accelerated materially by not pasturing too close. Land, to rest in comfort, needs a thick blanket of grass, to keep it warm in winter and to keep it cool in summer.

We have spoken briefly of the farm, which represents capital; but capital without labor is of little value, and a farm without a farmer will not produce anything of value, except possibly grass.

To mark out a prescribed rule for every farmer to follow would be indeed a hard task, for the farmer meets with a great many different conditions. We hardly ever have two seasons just alike, therefore there is more or less difficulty in overcoming these different conditions; but there are some set laws or rules that are always in force. We will briefly enumerate these rules.

Plowing in a workman-like manner. This rule, if rigidly enforced, will produce profit.

If poorly or slovenly done, the farmer will suffer loss.

After plowing, the next step will be a thorough preparation of the soil to receive the seed.

Too much stress can not be laid on at this stage of farming. Do not slight this part of the work; it will pay big interest every time to do it well.

The seed to be planted will next claim our attention. It is a matter of great importance to successful farming. A paper could be written with profit on this topic alone—"farm seeds."

The first thought that enters our mind when we look at a kernel of any kind of grain is, "Will it grow? Is there life in it? Is that life of a strong, reproducing character, or weak and sickly? Is it a true type of its kind?" It is the law of nature that like begets like.

Now, if this is an established fact, and we think it is, how very important it is that all farm seeds be thoroughly tested, both as to adaptability and climatic conditions, and the per cent that will germinate and produce healthy plants.

I have had some valuable experience along this line the past two years, which may be of interest at this time. We have special reference to corn.

The year 1900 I planted five bushels of corn known as "Riley's Favorite," a standard variety. It was grown 100 miles south of this place, and I believe it to be a very fine variety and highly bred, but not adapted to our soil and climate. I planted this corn, which did fairly well in 1900.

I also planted other corn grown in our own county of Will, which yielded ten bushels more per acre, under the same treatment, soil and conditions the same.

In 1901 I planted all of the last named variety, except ten acres of the former variety. This was on a 20-acre piece very nearly equal in fertility. On the ten acres alone I lost more than 100 bushels of corn by planting seed corn not adapted to our soil and climate. There was a greater difference in yield in 1901 than in 1900.

These are facts, not theories. This, to my mind, in a manner demonstrates the importance of a careful selection of seed.

Farmers are just beginning to learn that there is a great deal about corn that they do not know, and when a man comes to this point he is ready and able to learn fast and to his very great advantage and profit. And this will hold good of all other farm seeds and vegetables.

We have spoken incidentally of livestock on the farm, but what is a model farm without good livestock connected therewith?

Is there any branch of business that will afford more real pleasure than the breeding and growing of fine stock? We can think of none. What delights the eye more to the true lover of the beautiful, than a fine herd of cattle, a beautiful horse, a fine flock of sheep or a pen of fine hogs?

There is nothing will afford more real enjoyment to the boy or girl than a fine Shetland pony.

But some will say all this fine stock is for the rich or well-to-do; they require too much attention and care; the outlay of time and money is too great.

But can anyone name a business that is carried on for profit as well as for pleasure, without capital, labor, and close attention to business? If there is such a business, we have failed to find it.

In speaking of capital, it does not require a large outlay to begin in a small way to breed pure bred stock of any kind you may choose to engage in.

I am convinced this is the proper thing to do. It will cost but a little more to raise a good animal than to raise a scrub, and in a few years you will have a fine herd or flock. Then there is a pleasure and satisfaction in raising the best, and a corresponding depression and disappointment in raising a scrub. There is profit in the good, a loss in the poor.

We have in a meagre way tried to impress upon you some of the more essential attributes of good and poor farming, and its corresponding success or failure; but there are a great many things that go to make up a full, rounded, profitable life besides houses or lands, stocks, bonds or money. These are all good if we have the proper knowledge to use them rightly, and we count them as temporary blessings.

Our chief aim in life should be to better our condition, morally, mentally, physically and temporarily, and to elevate mankind into a nobler being, and to be best qualified to meet all these conditions, the first thing is an education. The word education means a great deal. It is very flexible, it can be lengthened or shortended, widened or narrowed, be good or bad, scientific or a mere cipher, it may take years of hard study to acquire, or of short duration. Everyone has some kind of an education. The field of education is as wide as the universe, and unlimited. We learn something new every day, and yet how little we know compared with what there is to know. For this reason we must specialize along some general line that pertains to our business to make it a success.

All the great industries of the country are looking for educated young men and women, that are honest and want to work. There will always be a demand for this class of labor, and we think the time and money spent on a practical education will be a good investment; but some may inquire what constitutes a practical education? Our answer is, a thorough knowledge of the profession or business in which you are engaged.

You will pardon me, and with your permission, I would like to express a thought that has been dear to my mind, as a friend of education, a need of an agricultural course of study in our rural or district schools.

The city schools are way in advance of the rural schools, even in nature study, and they are bending every energy to educate the child for practical work along manual training lines, to fit them for the trades, that they may be expressly fitted for city life. Why not give the boy on the farm an equal chance with his city cousin? He is as equally deserving, and perhaps just as smart. What will the farmer boy know when leaving the eighth grade, or any grade, as now taught in the rural or district schools of our State about agriculture? Not a great deal. We think a remedy to meet these conditions would be to introduce a course of study in our rural schools along the lines of agriculture and stock raising, broad enough, wide enough and long enough to give some general knowledge of farming and stock raising, from a practical standpoint.

The object is not to fit the student for teaching, but to enable him simply to grow larger and better crops, to feed grains and grasses to the best advantage, to maintain the health of the animals and improve the quality of all his products, and market them to the best advantage.

Surely the boy on the farm ought to learn in school something of the chemical elements that go to build up the plants, which he proposes to cultivate. He should know which of them come from the atmosphere and which from the soil; he should know the elements of plant food; he should learn to talk intelligently of the fertility of the soil, and the effect of fertilizers on the soil, and at a proper age, if possible, let him take a course in some agricultural college. This, combined with practical experience, should equip a young man to take an advanced position in society and a forward step in practical farming for profit.

Do not think that time spent in preparation for your life work is time lost. "No time is lost in sharpening the scythe; the prelude on the grindstone makes a quicker harvesting," Tuning the instrument is the way to the way to the best music.

We believe that education is one of the great forces that has made this nation one of the foremost in the world, and the pioneer movement of this greatness had its birth in the free district school.

Let me impress upon you the importance of keeping the district school up to a high standard of usefulness. Too rigid economy in not providing a competent teacher, and having a good equipment will produce a loss that can never be overcome.

Looking from another standpoint of our subject, "Profit and Loss," it might be profitable as farmers and those that are engaged in other pursuits, to give some attention to political economy, for political economy has been and will be one of the great forces that governs this land.

This force is extending daily. All nations of any note are taking a keen interest in our political situation and business affairs, and we are beginning to think that we are the lion of the party.

How much or how little of political life shall enter into the agricultural or business man's life is his own prerogative. This prerogative should be used in an intelligent way, for only by the study of the past are we capable of shaping the future of this great fabric called government.

Past history shows that the farmer citizen has been the sheet anchor of this great, free republic, and he always will be, if he lives up to his high privilege and keeps abreast of the times, and we think he wiil.

What class of men have greater opportunities to study political economy than the farmer with his quiet home life and wholesome environments, where he comes in contact with nature and nature's laws, which are perfect, calculated to elevate and enoble one's mind?

It is with a feeling somewhat of pride as a farmer, we look back to remotest history, when a great leader was wanted in some trying emergency, he came directly or indirectly from the farm, or from the life of a shepherd. Time changes all things; what was new a few years ago, is old today; we are living in an age of rapid changes; we are making history at a rapid rate.

The nation is confronted almost daily with new political issues, and the rural population to meet these conditions and keep the wheels of this great government running smoothly, must study these changes and be quick to detect and separate the good from the evil.

If we are to hold and maintain the balance of power for good we must keep our forces concentrated and enlightened, so that we may be able to check harmful or vicious legislation that may be detrimental to all people. The better element in the cities is looking to the rural population, as a safeguard, to enact wise legislation, and to thwart combines and ring politics, to further their own personal interests.

It means something to be a citizen of this great republic. You can use this citizenship with profit to yourself and to your fellows, or to a corresponding loss. We are living in an age of opportunities, an opportunity is a condition, something akin to time; if we do not improve them they are gone; some would be better lost. There is no time in life that opportunities do not present themselves, but the young are especially surrounded with opportunities. They will increase up to a certain age, and decrease as old age comes on.

In this day when a young man or woman begins to look around for an occupation or life work, there are so many fields open it is hard to make a choice. It would seem that opportunities have multiplied with the increase of population; a few years have wrought wonderful changes. A short time ago trades and professions were limited in numbers; but today they are numerous and diversified, thus giving employment to a great many different classes, and the best of all is the fact that this vast army of workers are employed to their full capacity at the highest wage the world has ever known, seemingly all working at a profit.

Let the young man or woman deliberate carefully before entering upon their life work. Before mapping out a business or professional career, take stock of your mental and physical condition, and if I were to give any advice to a young man in choosing an occupation, it would be, if you are not physically sound, strong and healthy, and if your mental condition is not above the average, you had better not enter the professions.

It will take too much valuable time and money to do much guess work in this direction.

You have often heard it said there is room at the top, and so there is, and always will be, but it is the strong, healthy, bright fellows that get to the top, and at the bottom of the ladder there is scarcely a hand hold, let alone getting your foot on a round.

It will be profitable to improve our opportunities to build character.

There never was a greater need for strong men and women, of lofty principles, with indomitable will power, to stand for the right, and to put down and overthrow the wrong, than at the present time.

In my opinion, we as a nation are drifting or separating into three great classes. The wealthy, or very rich, the middle class, those of moderate means, or well to do, and those that are known as the poor.

As the nation grows older each class will become more exclusive, and there will be a wider spread in their social relations.

Wealth is desirable, and there are a multitude of people striving to possess it, with every known means that they can command; they think this in turn will promote their social standing, and that their families may live in luxury and ease, and just here is where wealth is a menace to this great republic.

This social problem is one that should meet with our careful consideration.

Is it not a fact that an over surplus of wealth begets degeneracy in a family? How often have we seen the sons and daughters of the wealthy make an abject failure of life, physically, morally and financially.

Wealth begets pride, love of ease and immoral habits, that weaken body and mind, and sooner or later this family will be found in the ranks of the poor.

This same principle will hold good in national life as well as individual. It has with few exceptions been the history of all past nations, that their downfall has been traced to wealth among the few in high places, causing political and social degeneracy.

Wealth is a great force for good if rightly applied. It is a correspondingly great force for evil if misapplied.

The greatest force and safeguard of this nation is the great army of workers, that are known as the common people. They come from every walk in life, the farm, the field, the shop and factory, and from the professions.

This combination of interests has placed us in the lead of all nations, and I want to congratulate the farmer and all those that are conneeted in any way with producing any product from the soil that they have had more to do with the rapid growth and the accumulation of wealth of this nation than any other class of people, and my advice would be to still hold a membership in an occupation that has produced these grand results.

The farmer may not always receive his full compensation for his labor and capital, but he has the satisfaction of knowing that he is the king bee in the hive, and that he is following the most honorable, lofty and independent calling of any in the land. But whatever our occupation or calling in life may be, if it brings to us prosperity, happy homes, contentment or adversity, these things are only temporal, and if it were possible to possess the world, yet we might be poor.

To my mind the most profitable investment will be in building a noble character, advancing the cause of righteousness, and laying up treasure that we may enjoy throughout all the ages.

COOK COUNTY MARKET GARDENERS.

[By L. A. Budlong, Chicago.]

Of the area of Cook county, about 1,000 square miles, one-third or about 300 square miles is occupied by the city of Chicago and suburban villages, leaving about 700 square miles of unoccupied land, except as it is used for agriculture. Of this amount, it is estimated that about one-half or 350 square miles, is cultivated. Add to this 50 square miles of cultivated land lying inside the limits of Chicago and the suburban villages, and we have 400 square miles of land cultivated within the limits of Cook county, and one-third of which or nearly 90,000 acres is cultivated by market gardeners.

Some of these are engaged in raising specialties, among which is the cultivation of cucumbers for pickles, cabbage for sauer kraut, and onions for table use, for pickling and for sets. All of these products are very successfully raised and in such large quantities (one man alone raising 250,000 bushels of onions and cucumbers in one year), that Chicago has become the chief market for these vegetables and commands trade from all parts of our country.

The balance of the gardeners are more or less successfully engaged in producing a general assortment of market vegetables.

The soil for the most part throughout the county is of such quality that it can be made at minimum expense most excellent garden soil. The city furnishes plenty of fertilizer and labor and a ready market for the product, making altogether such ideal conditions favorable to the gardener as exist around no other city in this country. Many gardeners are wide awake, see and profit by the situation, maintaining most excellent gardens. Some others seem to adhere to our early ideas that "Illinois soils would grow anything without fertilizing," and avoid the expense for labor and manure without recognizing that no land in its natural condition is good enough to most successfully produce a general assortment of garden vegetables without fertilizing.

When the writer sees such gardeners, with such management, he can not suppress the wish that by some means he might teach them how and what to do, knowing that it would produce in place of dependence and trouble, plenty and happiness.

With this in view, a little of the writer's experience gained by a long life in the business, may be indulged.

When I first began here in 1857, the prevailing idea was that the soil did not need a fertilizer, that it would grow anything without it, and it took me several years to learn how utterly untrue such a statement was and that I would have nothing to do with it, and in looking back now I can see that I have prospered just in proportion as I have prepared and fertilized the soil and cared for the crops. Received what I was entitled to, and no more.

From land that in its natural condition was not worth cultivating, I have made one of the best garden farms in this country. One part of my farm consists of land that was too wet to be sure to produce a crop. I tiled and drained this land, using three-inch tile, placing the strings eight rods apart and from two and one-half to three and one half feet deep. The ground being subject to overflow, I put an embankment or levee around the entire land, so as to have to care only for water that fell upon it, and used steam pumps to pump the water off when it would not run otherwise. I use the centrifugal steam pump, eight-inch delivery, and three such pumps take care of what water falls on about 500 acres. I fertilize from 40 to 60 tons of stable manure to the acre yearly, applying it and plowing the land in the fall of the year. The yield of crops will average 400 bushels per acre yearly, and sometimes yields 1,000 bushels per acre on some of it.

I regard it as the most perfect garden land I ever knew, and there is plenty more that can be made like it.

I have been thus particular in my description of this for the benefit of others who may need the information, for when I started to make this improvement I could find no example, or anyone who had had experience, and I worked at a disadvantage for want of the information.

To those who may not have the experience I want to say, don't cultivate poor land, but fertilize and make it in the best condition possible.

Crops on such land are troubled less by insects or any other thing that would injure the crop, on account of the greater vitality the plants have, and the yield is always more in proportion to the expense than on poor soil.

Of insects there are always some, and a good remedy to drive away or kill the following kinds, such as the little black flea that attacks the plants of cabbage and that variety, the striped yellow bug that attacks all vines, and the aphis or plant louse that feeds on most all kinds of vegetation, is a light sprinkling of tobacco dust when the leaves are wet or damp enough so that it will adhere to them.

Paris green or Bordeaux mixture sprinkled on the plants is another good remedy, but needs care in using it, as it will injure the plants if used too strong. For killing the potato bug or Colorado beetle, Paris green is the best.

For destroying the different kinds of cabbage worm we can not use poison, and there does not seem to be any better way than to depend on good cultivation.

Another great pest is a little almost microscopic insect, known as the Thrip, or more generally the Onion Thrip, on account of its frequent depredations on this vegetable. It will also feed on almost all kinds of vegetation, and the gardener frequently attributes the bad condition of his crop to other causes, when this insect is the depredator, because he does not see the insect. To sprinkle with Bordeaux mixture is the best destroyer.

The large worm that is sometimes very destructive to tomato vines can be largely avoided by taking each year new ground for the plants, as the miller that lays the eggs, does so near by where it is hatched from the cocoon.

The common cut worm which is sometimes very destructive, can not be destroyed by any of the above methods, largely on account of its habits of feeding near the root of the plant, on the surface or just under the ground.

This worm is hatched early in the fall and is very small, almost microscopic. As soon as hatched it takes up winter quarters four or five inches under the surface of the ground, and in the spring the warm days that start vegetation brings it to the surface, where it feeds until about the tenth of June in this climate, when it forms a cocoon in the ground, which hatches the parent fly in August. This fly resembles a honey bee, and is about two-thirds its size. Its habits are nocturnal and it lays the egg which produces the next year's crop of worms as stated above, prefering poor land in which to deposit its eggs, as ammonia seems to be offensive to it, another reason for manuring land well.

Plowing in the fall destroys many, but the most effectual means for destroying the worm is to keep the ground clean from weeds and vegetation, so that when it awakes from its long winter sleep and finds nothing to eat, it starves to death.

The above process, particularly the latter, has eradicated this worm from the writer's lands almost entirely.

Good seed is among the most important things to have, and the best and surest way to obtain it is to raise it ourselves, always selecting the best stock to raise it from.

One more thing, don't let the weeds grow and seed the land. Destroy them, no matter what the cost is. The gardener who has once learned the advantages of keeping the ground free from weed seed, will never willingly return to the old method of securing the crop and letting the weeds care for themselves.

In addition to insect depredations many plants are subject to fungus growth or mildew. Among the plants that are most liable to be attacked are cucumber vines. The leaves will begin to show spots of yellow, which in two or three days will spread over the whole vine and field, destroying the whole crop. This disease has been very destructive among the pickle growers for the last two or three years, particularly in the east where it is the most prevalent, but last year it made its appearance in the west. Bordeaux mixture applied when the vines are first affected, will some times arrest the disease and save them.

A disease of this kind has nearly ruined the asparagus business in the east, and there are great fears among the asparagus raisers that it too is traveling west. The disease is a fungus growth that attacks the inner bark of the plant in the latter part of August and September, killing it and injuring the root so that it grows only a weakly, spindling plant, of little or no value.

As the fungus attacks the inner bark it can not be reached with any of the usual remedies, and there is no known way to stop the growth, and many gardeners are having their beds plowed up and giving up trying to raise asparagus. So far, it has not appeared much in the west.

Potato vines are subject to a similar trouble, known as the blight, but the writer's experience is that the cause of the trouble has more frequently been insects than fungus growth, and will yield to insect remedies if taken in time.

Among merchants there is a saying that "an article well bought is half sold." This is true with the gardener who grows a good crop. It will command a preference, be sought after at the highest price, and present none of the difficulties experienced by the careless, improvident man, who blames the market, the weather, and all but himself, for his misfortunes.

GRASSES—THEIR USE AND ABUSE.

(Paper read at JoDavies County Farmers' Institute by George W. Russell of Dunbarton, Wisconsin.)

Of our grasses, we will take them as we found them in the early fifties when the country was new. We settled in the town of Blanchard. It was the rule, and not the exception on the Pecatonica bottoms, to see blue grass or blue joint that would stand as high as a man's head and produce from two to three tons of the best hay to the acre. But in our greed to get all out of the land that there was in it we broke up these beautiful meadows to raise wheat. We had fairly good wheat for a few seasons. Then came the chinch bugs and they were as numerous as the kernels of wheat. Then we tried corn and the bugs covered the cornstalks and shrivelled the ears; then we tried oats with no better results than with the wheat; then we tried timothy and clover and the frisky steer, who always pays if we give him about one acre of good pasture for one year old and two acres for a two year old and three acres for a three year old steer.

When L. C. Russell was on the farm he pastured two lots of steers on mammoth clover and blue grass pasture. One bunch of steers made a gain of four pounds a day on this pasture. They were high grade short horn steers for May, June and July. They were sold off the pasture at a good price. The other load was in same pasture and made a gain of over three pounds a day for five months and sold off grass at a good price in Chicago. The pasture was remarkably good all the season.

Early in the season the blue grass pastures were good, and late in the fall—June, July and August, the mammoth clover was at its best. We will say right here that we have had considerable experience with blue grass pastures and the best results in clearing lands of timber for a permanent pasture is to cut the timber off the land and seed to blue grass. We have grubbed and cleared over 200 acres in Wisconsin. That was when we had more money than good common sense. When a man goes against nature he is going against the stream.

We found by experience and observation that where we cut the timber and burned the brush we had the best pasture lands. If the new land is plowed or broken up and a few crops are grown, the blue grasses will not give as good results as to seed on stump land. We do not know that the stumps help the grass. It is a great expense to grub out the stumps. If you doubt my word try a hundred acre piece of stump land.

We have had very good results in sowing mammoth clover and timothy seed on new burned over timber land. If we were to have only one kind of clover, we would have the mammoth clover as it makes such a growth. We have grown it six feet long. If you doubt this statement, ask Warren Hill of Warren. We have not had any great amount at one time, the largest amount being 140 acres in one season.

TWITCH GRASS.

Perhaps twitch grass is as good a grass as can be grown on bottom lands that are subject to washing ditches. If we had twitch grass in our fields along the draws, we would not have so many ditches. We have one long hollow that has considerable twitch grass that grew by our neglect. We think it all O. K. as it makes good pasture and hay. It should be cut early before its seeds ripen. We are of the opinion that it would make a good meadow on low lands.

The late Samuel Rickard, while speaking of twitch grass, says it is one of the best grasses we have for hay and pastures. The great fault found with twitch grass is that we can not kill it out. If that is the only reason, we should like to have all our pastures and meadows full of it.

Speaking of good pastures, the Hon. J. S. Gallagher has a pasture that has a large part of blue grass, near my place, that was the talk of the neighborhood this season, both Mr. Gallagher's cattle and his good blue grass pasture. We have not had any talk with him about the gain for the season. The cattle were in good order all through the season and would have sold off the grass with a good profit at any time after June.

Another instance is the Saunders Brothers. They have a large blue grass pasture on the Pecatonica bottoms near Red Rock. These gentlemen are stock and dairy men who sell their milk to a butter factory and cheese factory. When they have a flush of milk, it is not uncommon to see them hauling milk to the factory with a three horse team, they believing in good grass for good results.

The possibilities of good grass lands: We will say right here that they sold steers in Chicago lately for $102 per head and these gentlemen have a load of yearling steers that will tip the beam at 1,000 pounds each. The cattle are Black Pole.

What does the farmer with a scrub farm, with scrub stock and scrub pasture, giving the stock scrub care, realize from his two-year-old scrub steer? Anywhere from $25 to $35 per head. These cattle were a loss from start to finish.

Hon. John Bray of Darlington, one of the best stock men in southwestern Wisconsin, while speaking of pastures, said he had too much land in crops. He had to seed down to grass his plowed land. We were curious to know how much plowed land he had. He said, "My farm consists of about 168 acres and I have 15 acres under plow and I find that I have too much plowed land." Mr. Gray has a ranch in Dakota of 10,000 acres all in pasture and meadow with a large herd of cattle.

Another man at Red Rock, Ashton I. Thompson, put 30 calves on 15 cows, letting the calves to the cows morning and night. The cows ran in a good blue grass pasture until September when they were sold. The calves were fed a very short time on grain and hay and when put on the market in December, they realized $30 per head. Nearly all the expense of the calves was the pasturing of the cows.

We read that "all flesh is grass," but all grass is not flesh. The man who makes two blades of grass grow where there was but one is a benefactor. Brother farmers, it is not who has the most acres of pasture grasses, but who has the best on a given acre.

We sowed eight acres of Dwarf Essex rape. Some of the land was remarkably rich and a small part was very poor. On the good land the rape was from two to three feet high and on the poor land it was six inches high. We find the same rule in timothy and clover—where the land is rich we can cut from two to three tons of good hay and on poor ground 800 to 1,000 pounds to the acre.

We predict that the time is not fard istant when "grass is king." The revival of stock growing is upon us. To accompany it we must have a revival of our pastures. Thousands of acres in Illinois and Wisconsin should never be touched by the plow. Their great value lies in their adaptability for grazing sheep and cattle. The more grass we can produce the more stock we can maintain and the sooner we will return to a higher state of fertility in our soils.

Of all our grasses the Kentucky blue grass seems most widely diffused in our section. Wherever there is lime in the soil it will be found the leading species. Blue grass is a pasture grass and is nearest the ideal for the purpose. It starts early in the spring and its sod is close. We had a little orchard grass with fair results. It is quite apt to grow in bunches and leave blank places in the field. Without any other grass it makes good to fair hay and fair pastures with other grass. Would not recommend it sown alone for pasture or hay. It is said to be at its best in an orchard.

We sowed several acres of Alsike clover ten years ago and it made good hay for stock. It was rather small, not yielding as much as red clover, but of better quality for hay and pasture. The stalks are finer than other clovers.

We sowed one bushel of Alfalfa clover seed last spring. It came up nicely but the drouth hurt it considerably. We sowed with oats and there is where we made a mistake. It had better been sown alone and mowed a couple of times to keep the weeds down. The tap root goes down to solid rock or water level. We tried to pull up some of the plants and found that they went straight down. The tap root of the one we succeeded in pulling up was 16 inches long. We got the seed from Kansas. Earnest V. Tuttle says the roots go down 20 feet. Talking with Dr. Tuttle about it, he says he has seen the roots down 20 feet below the surface alongside of streams. Mr. Job Thompson of Montana says he cut three crops a season and gets about nine tons of hay a season off an acre. He also says he has cut hay five months in a season commencing in May. He does not know how deep the root goes down but they who profess to know say it will go down 100 feet unless it strikes bed rock or water level. The deepest Mr. Thompson ever saw it was 40 feet. He recommends sowing all draws or hollows with it but not where water stands, though flooding it for a short time does not kill the grass. For a good permanent pasture he recommends 35 pounds of seed per acre, then the grass will grow fine and stock eat it. Cattle and horses do nicely on it. When you get a good stand nothing but sheep or dynamite will kill it.

We sowed five bushels of red clover seed and it all died out with the drouth. Alfalfa clover stands like a stone wall. When it froze up there was a good, fair stand of it.

When speaking of winter pasturage, we have pastured our colts and horses for ten winters on our bluegrass pastures. When the snow gets crusted so the horses can not get to the grass, we take a team of horses and plow and break the ice or crust. Then the horses can feed very well on it.

In order to have a good winter pasture the stock must not run on the pasture after August, so the bluegrass will get a good growth. The horses will live on it as long as the grass holds out and do better than they will in the stable with good hay and a little grain. The number of acres to each horse depends largely on the pasture. In good grass I would say two acres for one horse from the first of December to the first of May. In case you want the horse for spring work, I would commence feeding grain one month before work commences.

THE ABUSE OF OUR MEADOWS.

To pasture a meadow in the spring and expect to cut a good crop of hay and then to pasture after harvest, is a very poor way to make it pay a good dividend. It not only spoils the meadow, but makes scrub stock and a scrub farmer. The better the land the better interest you get on your money invested.

PRAIRIE HAY.

The yield of wild hay in the prairie region is far from uniform, depending as it does upon the amount and distribution of rainfall through the growing season. Hay meadows that are cut continuously for a number of years deteriorate rapidly both as to yield and quality of hay. The latter depends upon the relative amount of weeds that the hay contains.

Wild meadows are not given the same treatment as tame meadows; they are neither reseeded by the farmer nor allowed to reseed themselves. The natural result is that the vitality of the grasses is diminished and they are unable to hold their own against the weedy perennials that are so abundant in all prairies. The weeds increase so rapidly that they soon gain the upper hand and become more numerous than the grasses and the meadow loses its value as hay land.

Good hay land in the west is worth anywhere from $10.00 to $20.00 per acre more than any other class of raw prairies. An average yield from such meadow land is a ton and a half to the acre. In exceptional seasons it often amounts to two and one-half tons. The price of good prairie hay varies from $5.00 to $12.00 per ton. With such yearly yields and at such prices, it will pay to improve the prairie meadows so that the product shall not decrease in amount or deteriorate in quality. The wild grasses should be permitted to reseed themselves at least every three or four years.

In the early 50s it was the rule, and not the exception, to cut all our hay on the prairie. We would commence cutting prairie hay, as we called it, and work at it till harvest, then lay off for harvest and threshing. When we got through with that we would commence haying again. Wild hay is quite different in its makeup from what tame hay is; it will do to cut any time before frost kills it. On the plains the Buffalo grass cures standing and makes good pasture all winter.

BLUEGRASS PASTURES.

If you farmers would sow bluegrass seed for a winter pasture, you would not do without it any longer than another spring, when you would sow all of your draws and hollows. To make good beef and raise cattle at a profit it is necessary to keep the steer growing continuously from birth until it is ready for market. The more rapid the growth the sooner the cattle can be turned off; and the quality of the beef will be better, commanding higher prices. The only natural solution of this problem is to raise grasses and clovers so as to be able to supplement the scanty feed in periods of scarcity. In answer to the question, "Shall we plant more grasses?" when clover was at its best we sowed clover and grass seeds with all our small grain and in the spring plowed up all that was not good and planted to corn.

Year Book of Agriculture—

Acreage of hay in 1895, of the United States, 44,206,453.
The hay crop in tons, 47,078,541.
Money value, $393,185,615.

It is fair to presume the pasture grasses are worth as much as the hay crop in the United States, which is $786,360,230. The wheat crop for 1895 in the United States was 467,103,000 bushels.

SANITATION UPON THE FARM.

[By Dr. J. A. Kirkland, Cambridge, Ill.]

It will be unnecessary to make an excuse for presenting to this organization a paper upon sanitation upon the farm.

To the effects of sanitary improvements we may attribute the remarkable gain in longevity over the seventeenth and eighteenth centuries— a rise of the average age of life from 15 and 16 years to over 40 years at the close of the past century.

We are conscious of the fact that very little attention has been given to health preservation in rural districts. The general training of the country resident does not prepare him to cope with this great and important factor in our prosperity, happiness and longevity, and as it is not in his line and liking he has delegated it almost wholly to the resident of the city and town.

Overcrowding, uncleanliness, filth, poverty and destitution have entailed such a long list of unsanitary conditions in centers of population that they are forced to more effectual systems of protection. Through their boards of health they have abated nuisances, closed their gates against the approach of infectious diseases, the general health has been taken under consideration, and in many cases valuable education has been given to the public along these important lines.

But the farmer so far, has taken little personal interest in the matter. He has felt secure in his isolation, abundance of fresh water, pure air, and wholesome food. What misfortunes have befallen him he attributes to the kind hand of Providence, little thinking that his calamity eight times out of ten is caused by neglect, and might have been averted by intelligent precaution on his part, as sanitary official of his own domain. He gives the subject little thought. He has not demanded much of the legislatures and has gotten but little from them. If the question were asked here today who constituted the township board of health, I venture not one in a hundred could tell, and if these officers were asked what authority they might exercise in case of sudden outbreak of disease or flagrant violation of prudence, they, or most of them, would have to refer to the statutes to find that they had very little to do, and with less inqiury they would find that they were poorly qualified to do that little. They are but nominally a board of health with no effectual authority. There can be no excuse for this indifference while there are so many thousands annually dying, and many more thousands suffering from preventable causes.

So long as the health board is normal in function and ineffectual in its work, every man should be an intelligent sanitary authority on his own farm, and should prepare studiously to perform the fundamental work essential to protect his family and stock against the invasion of disease.

In former times four-fifths of all deaths were due to preventable causes, and even now, when the death rate has been reduced to one-fourth of what it once was, still one-third of the deaths occuring are due to distinctly preventable diseases.

The physical and moral man are interdependent. In large measure what degrades one degrades the other. Health bears quite as close relation to general material prosperity as to morality. Sickness brings in its trail, especially among the poor, uncleanliness, misery, poverty and destitution.

The purpose of this paper is to indicate some of the ways in which hygiene, both private and public, are connected with the duties of the farmer, and to call attention to a few common sense methods of preventing disease.

While it is not the business of the farmer to treat disease, he is none the less the custodian of health, so far as preventing disease, than is the physician. While the public health officer, who bothers himself very little about the farmer, may lay down rules and point the way he must, if he would preserve public health, see that ordinary correct laws of science are not violated within his domain.

The great effort of the medical profession through the past ages has been to discover the cause of disease. The search light of science has been constantly seeking out the dark places and many theories have been brought forth, held, examined and let go again as not tenable. Others after long observation and experience have demonstrated their power to predispose or actually excite disease, until the field has been narrowed to approximately the following list as being active in the cause of disease. (1). Heredity. (2). Impure air. (3). Impure water. (4). Climate. (5). Habitation. (6). Occupation. (7). Food. (8). Clothing. (9). Intemperence. (10). Exercise. (11). Contagion and infection. (12). Psychological influences. Of these impure air, water, habitation, with possibly occupation and sometimes food, might be considered under the head of contagion and infection. So far as they effect our purpose at this time a careful observation will demonstrate that their deleterious effect is due to the foreign germ life which they contain. Climate we can not control; intemperence only when we are more prudent; heredity when we are wiser; psychological influences probably never. This leaves the group which we placed under infection for our consideration.

Germs float in the air, they impregnate the water, they find their way into our habitation, they surround us in our occupation, they ferment and pollute our food, they cling to our clothing, and in fact are every place where conditions are favorable to their existence. It is the innoculation with these germs that propagates contagious diseases, and many that are not strictly contagious. Many diseases have their specific microbe, while many others are due to the common microbe of inflamation. These germs must have a place to propagate and a medium through which to be distributed.

Water is the most essential element to the growth, development and distribution of these cells. Without moisture or heat they can not develop or reproduce, but once in existence some may retain vitality almost indefinitely without moisture and indifferent to temperature. Water being equally indispensable to man and beast, it becomes important that this be pure. The diseases caused by impure water are certain specific fevers, diarrhœal diseases and some affections due to parasites that find entrance into the system through this medium.

Great care should be taken in the location of wells both for house and stock use. They should be on high ground and well drained about the surface and placed at long distances from out buildings. They should never be placed in low damp ground simply that water may be easily obtained. This water is always loaded with organic matter and is impure aside from its great liability to infection with germ life. No mud holes or hog wallows should be in proximity to the well or on the farm. A shallow well is a menace and a curse to any farm. The seepage from carelessly located outbuildings, even through long distances, has frequently found its way into wells and converted the water into a most dangerous element, without even a hint in its clearness of the poison it contains.

This caution is not a needless one, though you shall say how many farm yards are in the very condition I warn you against, with the stock well in a ravine or slough, and close by a hog wallow. Every time a hog goes into this mudhole he carries some organic matter and a deposit of germs. The warm sun supplies the heat that will soon convert this into a seething mass of microbic organisms that may, by almost direct connection, find their way into the water.

We all know how, under much less favorable circumstances, germs have found their way long distances from water closets and cess pools into wells and created an infection that has cost hundreds of lives. It is dangerous for man to drink this water, why not also for the horse, the cow, the hog? They live by the same physiological processes that we do; they are subject to many of the diseases we are. Why may not many of the so-called hog choleras be traced to infection of this kind. How can animals thrive whose physical life is constantly at war against such a dangerous element, even if they be so fortunate as to escape disease?

No great amount of water should be slopped about the surface of any well to create moist or muddy ground, nor should domestic animals have direct access to them. Be sure that all water on the premises is pure and wholesome. This should apply to stock as well as table water. This perhaps should be the strongest point of view.

It seems hardly necessary to discuss the subject of impure air. The rural inhabitant is blessed with the best air the country affords. It is not vitiated by overcrowding or the great volume of pent up shop, basement and warehouse air that is constantly being forced upon the streets of our cities. Most farm houses are fairly well ventilated. This subject is of most interest as concerning the school house and the houses of large families. When we remember that it requires 3,000 cubic feet per hour to supply one person with air, we may form some idea of the great volume that a large family or school room will require. Twenty pupils during six hours of school will consume 360,000 cubic feet of air, or a block of air about 70 feet square. It may not be amiss to say that the centralized township school house may secure better ventilation, better heat and light, and is better in many educational ways than our district schools as they are now conducted. The injurious properties of air are carbonic acid and floating germs. The germs being mostly derived from expired air, drains and damp cellars. The evil effects of insufficient ventilation, although very certain and very serious, are not immediate or such as to attract attention at first except in very aggravated cases where there is excessive overcrowding. The power of the organism to adjust itself to surrounding circumstances is very great, and perhaps as great in regard to the endurance of foul air as anything else. Yet this power is greater in seeming than in reality, for at best such air produces disease and shortens life. The group of symptoms due to bad air is a tolerably constant one—loss of appetite, nausea, headache, giddiness, faintness and general sense of depression. The symptoms are frequently found in the school room. Impure air manifests its evil effects also in diseases of the respiratory organs, both acute and chronic.

Dr. Billings says it is necessary to remember that while good ventilation is a very desirable thing, satisfactory heating in cold weather is still more desirable, even if ventilation is interfered with for that purpose. The checking of the secretions and imperfect elimination consequent upon chilling the body being even more poisonous than imperfect oxygenation. Good ventilation costs money. In cold climates satisfactory heating, good ventilation and cheapness are not compatible. It is easy to obtain any two but impossible to have the three together. Therefore heat and ventilate well regardless of cost.

Under habitation we shall consider the house, house yard, farm and barn yard. The house should be built on high ground. All moisture in the soil should be carefully and thoroughly drained away. The cellar should be large, dry and well lighted and ventilated, built with brick walls and a brick and cement floor, so that it can be thoroughly cleansed and whitewashed, and at the same time prevent the ingress of gas, air and moisture from the subsoil which many times is loaded with infection. There should be no drain leading to suspicious localities—in fact no drain should open directly from the cellar. No decayed vegetables or organic matter of any kind should be allowed to accumulate in cellars.

The house should be as good as the farm will afford. The one thing I wish to urge as important—aside from a good housekeeper—is larger bed rooms than are usually found in the farm house. Sleeping in too small or overcrowded rooms brings us back to impure air. Every farm house should be equipped with a bath room conveniently supplied with water and easily heated. The lawn should be large and well supplied with grass and shade trees—though not dark and damp—and enough floral decorations to be attractive. The house and lawn should have wind breaks in the form of groves. The house yard should never be used as an incloseure for any domestic animals. No garbage and waste material should make it unsightly.

The barn and its yards should also be located on dry soil, and not in too close proximity to the house The barn and sheds ought to be large enough to shelter and protect all stock. No animal should be obliged to remain out from warm shelter during cold, damp or stormy weather. It cannot if you expect it to maintain a good condition on an economical amount of food. In the yard great heaps of manure and rubbish should never be allowed to accumulate. Dry, clean yards are the only safe ones.

Upon the subject of feed, there are many interesting considerations which I shall not venture to present. The late historian, Ridpath, says that custom is more enduring and ineffaceable than marble and granite, therefore you will probably continue to feed upon pastry, drink coffee and indulge in late suppers in triumphant disregard of any thing sanitarians may offer.

One is glad to know that happily, the farmer is supplied, in the main, with wholesome food. If at times, the doctor is called because the farmer eats too much or of too rich quality, he ought not to grumble. Good judgement in the use of food is likely to develop more rapidly perhaps in the country than in town.

By a careful review of our subject it would be seen, as before stated, that the great danger to health is infection. Disease is not so often perverted functions as it is a physiological process interrupted by pathogenic (disease-producing) germs.

The microbes are so abundant in nature that they exist by millions and even run far up into billions, so that our minds can not comprehend their numerical infinitude. A consumptive expectorates about 3,000,000,000 bacilli, a number so great that a man counting ten at a time could not count them in

19 years. One cubic centimeter or 15 drops of 'milk 24 hours old contains 2,500,000 to 3,000,000 germs. This simply shows their power of reproduction under favorable conditions. The natural conclusion is to destroy all disease germs.

Disinfect. Remove conditions favorable for their development. Destroy all organic filth. Drain or confine all unnecessary moisture. Let fresh air and sunlight into every corner and crevice possible. No dead animal should be allowed to decay any place upon the surface of the farm. Burn them if possible, if not bury them in dry soil, far from the approach of man or beast.

With your permission I wish to digress slightly from the main purpose of this already long paper, though on a topic strictly pertaining to farm sanitation; that is, to present some original ideas in regard to crows distributing hog cholera, as they fly from diseased yards and animals to clean animals. Texas fever is distributed by the bites of ticks, malaria by mosquitos, yellow fever by another mosquito, erysipelas and many other diseases are inoculated from the feet of flies. These insects are simply the carriers of germ infection. They deposit the germs in favorable fields for reproduction.

The crow feeds upon grain and dead animals and tramps through the litter in the yards and then passes on to other yards. Their excursionary habits take them 20 or 30 miles each day in every direction from the common roosting place. These daily excursions continue through the year, except during brooding. Each crow passes over practically the same country every day.

Some of the facts supporting the theory of their distributing this disease are: (1) They must necessarily be infected, having fed and tramped upon infected material. (2) Hog cholera is most prevalent during the months of their excursions. (3) The disease is often epidemic along the straight line of their flight. (4) The disease almost invariably breaks out in large yards which the crow frequents, and in which he easily finds opportunity to feed. (5) Cholera is due to a specific germ that finds its way into the system through feed, drink and air. (6) It attacks herds that no other hogs have approached. (7) There are good reasons to believe that it is not transmitted through the air.

The Bureau of Agriculture puts the loss from hog cholera at $10,000,000 to $25,000,000 annually. If these thoughts help to decrease this loss, I shall be glad; at least they may induce some to dispose of dead animals in a more cleanly manner.

The great central thought of sanitation is cleanliness—clean persons, clean water, clean air, clean food, clean clothes, clean houses, clean surroundings. Sunlight is the great germicide of nature. Water and heat and many chemical germicides are at our disposal, and by an effectual use of these means we shall have accomplished the great purpose of sanitation.

DEAD HEADS IN AGRICULTURE.

[By F. A. Warner, Sibley, Ill.]

Dead heads in the human family are persons who obtain something of commercial value without special payment or charge, especially those who receive free tickets to entertainments, free passes to ride on railroads, etc.; and it has been frequently observed that in the latter case the free rider, otherwise the dead head, is more exacting with conductor and porter, and more critical as to his comfort than the person who pays his way; in fact it is found more expensive to carry a dead head than a paid head eliminating the cost of the regular fare. The above I take as typical of many of the things in agriculture.

PARASITES ON THE FARM.

There are so many things that live on agriculture and thrive on it and yet do not only get that living free, but are a source in many instances of great expense and often permanent damage. There are furthermore many things in agriculture which may justly be called parasites; they feed upon it and pay nothing for it; they are on hand every season; they disappear possibly for a winter's rest only to reappear with greater vigor and a numerous family.

DIFFICULT TO PREVENT.

Referring again to the dead head on railroads we read every year about certain meetings of railroad managers in which a strict rule is passed to issue no more free passes, but from what usually follows it is about as difficult for a railroad to enforce that rule as it is for the farmer to completely eradicate the dead head weeds from his farm when his neighbor allows them to grow.

When we approach a subject like this we are just about overwhelmed with the myriad of free riders on agriculture and can only mention a few of the more important and those that possibly cost the most to carry and therefore should either be made to pay their way with profit to the farmer or else banished to that celebrated island where everything is a law unto itself and things are free and easy and the result the survival of the strongest. In passing let me enumerate some of these dead heads and further on take some of them up in particular.

THE PROCESSION.

Dead seed, inferior seed, weed seeds in grass seeds, and in seed oats, barren stalks in corn, smut in oats and corn, manure left to heat and burn up its most valuable fertilizer, the nitrogen, lumps and clods in soils, undrained land, unfruitful orchards, half crops in gardens, out of date, worn-out machinery and ill adjusted farm machinery, ill bred unprofitable live stock, injurious insects, work poorly done or done out of season, and not least is the want among our farmers of a realizing sense of the actual situation—they look at their neighbor and see that they have about the same old common year after year dead heads, and are contented.

DEAD IN THE HEAD.

There is something dead in the heads of us farmers and unless the dead matter is removed and some new live principles installed in its place we will all some day run up against the stone wall erected by our own children. Things will be much improved on their side and as they think we have always been fond of the dead heads they will be throwing some over on our side to make the contrast still greater. Let us examine some of our farm work. After we have properly prepared the seed bed, the next and most important consideration is the seed to plant.

POOR SEED CORN.

Take our corn for instance—we most certainly know we must plant live seed if we expect to grow a crop, but do we all take such steps as will assure us that we do have the live seed to plant? Grains of corn that will not germinate are dead heads because they occupy the space that should be in the possession of a grain that has life and will produce. If only 90 per cent of the kernels of corn planted grow then there is ten per cent loss and on a yield of 40 bushels per acre amounts at present prices of corn to $2.40 per acre. Then again if one farmer plants a variety of corn producing 75 per cent of shelled corn per bushel and his neighbor plants a variety up to the standard of 88 per cent we find that at 60 cents per bushel for corn, his neighbor beats him nine and three-fourths cents per bushel and at 40 bushels per acre it amounts to nearly $4.00 per acre, so we must conclude at least that 75 per cent corn is a $4.00 per acre dead head.

IMPROVED VARIETY.

And again there are varieties of corn of greater feeding value than others. If we have growing stock to feed and we can grow corn high in protein, the constituent most desired to produce growth in young animals, then why not grow that variety; if we find we must sell our corn for commercial purposes then why not grow that kind that has the most value for the particular use to which the purchaser wishes to put it, starch, sugar, oil, etc.

The seed grain that is to be the parent of the desired product takes no more room in the ground and requires no more labor than undesirable corn would, and is a dead head to that extent of per cent that might have been produced with the proper selection of the variety to produce the desired product.

BARREN STALKS.

There is another important and well known dead head in the corn field and that is barren stalks and suckers, they grow tassels and no ears. If allowed to grow they use a portion of the plant food that should be used by the good stalks in the hill and sift their degenerate pollen upon the silks to reproduce more barren stalks another year. They are worse than dead head and should be cut off close to the ground before the pollen ripens.

SEED OATS.

In our seed oats, unless we carefully clean them we have the oat with shell and no germ and the small grain with weak vitality—one a regular dead head and the other very near it. Purity in variety—uniformity in size and vitality—properly prepared seed bed and covered as nearly as possible to uniform depth is about all the farmer can do toward the producing of the crop.

LOSS FROM SMUT.

In the year 1900 the average per cent of smut in oats as determined at our agricultural experiment station was 14 per cent; here, then, is another dead head costing four cents per bushel, and at the yield of 60 bushels per acre that year, means $2.00 per acre loss.

The agricultural experiment station has solved the problem of prevention at a cost really trifling, and we have the choice of paying for the privilege of supporting the dead heads or giving them such a dose of hot water at 136 degrees that he has not a single per cent to say at harvest time. Treatment with formaldehyde is equally as good.

WEED SEED IN CLOVER.

Recent investigations at the agricultural department at Washington have revealed some astonishing facts regarding the dissemination of weed seeds. Seven samples of common red clover seed were requested of prominent dealers in farm seeds; the pure, good seed was separated from the dead and weed seed and dirt with the following results:

Sample at $5.50 per bushel had 55.8 pounds good seed, made one bushel pure seed cost $5.88.

Sample at $5.25 per bushel had 45.7 pounds good seed, made one bushel pure seed cost $6.90.

Sample at $4.75 per bushel had 48 pounds good seed, made one bushel pure seed cost $5.94.

Sample at $4.00 per bushel had 52.3 pounds good seed, made one bushel pure seed cost $4.59.

Sample at $3.50 per bushel had 27.72 pounds good seed, made one bushel pure seed cost $7.56.

OTHER TESTS.

Samples of red top seed showed respectively out of 14 pounds per bushel only 8¼, 2.4 and 1.3 pounds good seed. One sample of the clover had only 1-5 of 1 per cent of weed seeds, yet that made 990 weed seeds per pound, and in a bushel there would be over 59,000 of them; another sample contained 4-5 of 1 per cent weed seeds, being 3,000 in a pound and 180,000 in a bushel; still another sample was produced having 2½ per cent spurious seeds and there were 27,600 weed seeds per pound or 1,656,000 in a bushel.

SOWING WEEDS.

If we buy such seed as the sample and sow 12 pounds per acre we sow 11,880 weed seeds per acre; take the second sample and we sow 36,000 weed seeds, and the worst sample 331,200 weed seeds per acre; each one of these weed seeds having an equal chance with the good clover seed. We were offered some clover seed by a farmer at $5.00 per bushel; it had the appearance of being very nice seed. We took a fair sample of the lot and weighed and counted the entire sample with the following results:

There was 91.26 per cent good germinating seed.

There was 4.85 per cent actually dead seed.

There was .49 per cent weed seed.

There was 3.40 per cent dirt and waste.

There was in a bushel 54.75 pounds good seed.

There was in a bushel 2.91 pounds dead seed.

There was in a bushel 2.34 pounds dirt and weeds.

Upon this basis the good clover seed would cost $5.48 per bushel. We ascertained another fact—there are in a bushel 20,431,782 clover seeds and the sample examined contained 990,941 dead seeds and 53,685 weed seeds for which we would be asked to pay proportionately as much as for good seed.

BUYING DEAD SEEDS.

Recent investigations of other grass seeds showed conclusively that in a large number of instances the farmer who bought any kind of grass seed received a large percentage of dead and weed seed, introducing often upon the land entirely new weeds. Instances of red top seed, orchard grass, Kentucky blue grass and Brome grass were examined by the department of agriculture at Washington with the result that from 30 to 70 per cent of each of these grasses were weed seeds, dead seed and dirt.

STUPID TO PLANT IT.

What a myriad of dead heads, what a reputation for the farmer who grew it, what a recommendation for the dealer who sells it, and how eminently stupid of us farmers to again plant it. That would be rotation with a vengeance and ought to end up with a stoppage of the circulation of the parties engaged in it.

I think by this time you can see the dead heads in the other items without my taking your time to go into any further detailed statement or explanation of them. I think you must agree with me that they all exist, and further that they have lived upon us about long enough and it is about time we were up and doing something toward their eradication.

THE FIRST STEP.

The first step in this direction is the gaining of the knowledge enabling us to recognize these dead heads on sight. Most of us can talk by the hour of what we *have* done and what we are *going* to do, but to get right down to doing something is what we need. We say we know a Canada thistle when we see it, and talk about the best method of killing it, when the fact is we should not have any Canada thistles to look at.

KNOW YOUR PROPERTY.

We say we know dead seed when we see it; then why plant it in with the good seed? We stand very much in the same light that an old-time justice of the peace did when a man was arrested for stealing chickens. The attorney for the thief asked the owner to say how many roosters and how many hens there were in the lot stolen, and when he could not tell and the justice being appealed to for a decision, discharged the defendant on the ground that the owner had no case if he knew so little about his property. The fact is we ought to know about these things, and in this progressive age we have no good excuse not to know. We ought to be reasoning and reasonable beings. We are capable, if we will it, to choose the best and discard the refuse.

THE REMEDY.

If I were asked to apply a remedy I would suggest, first, a complete eradication of weeds on my own farm and induce my neighbors to do likewise. I would be exceedingly critical in the purchase of or saving of any kind of seed as to its purity and germination. I would test my seed corn, oats, wheat and grass seeds in particular. I would own a first-class fanning mill and would winnow and screen all my seed that I planted on my farm.

DOING THE CLODS AND WEEDS.

I would prevent clods by harrowing each day's spring plowing before I left the field, for there is where the clods originate. I would put a harrow or weeder after the corn planter and keep it going until the corn gets up and then get the cultivator into the field as soon as possible and make the weeds tired of trying to grow.

TESTING THE SEED.

I would follow this same principle as to other crops, and then when it came to sowing clover or timothy or other grasses, I would go to the most reliable seller. I would ask for the best seed he had of the kind I wanted. I would take a one-ounce sample and spread it on white paper, and under a good light examine it for good seed, dead seed, weed seed and dirt; and I would not buy it unless I could clean out of it the weed seeds and the dead seed, at least, because once sown with the clover or other pasture or meadow seed, they are hard to exterminate. Better to prevent the trouble at the start than try almost vainly to destroy them.

AGRICULTURAL SCHOOLS.

In these days of agricultural colleges and experiment stations we are warned of these dead heads and proper remedies are suggested. Let us avail ourselves of the results of the noble work of these institutions. May their good work go on and may we not fail of a proper support in these efforts.

The Science, or Art, of Plowing.

[By Alvin E. Stark, Plainfield, Ill.]

No doubt many persons will think there is little or nothing in the subject assigned me. To most people plowing seems a simple thing—something that anyone can do. To me it is a subject so full of importance that the time allowed me will be sufficient to mention only a few points.

Good plowing has been and still is, to a great extent, a neglected if not a lost art. The localities where a lively interest is taken in plowing are few and far between. A few farmers are, however, awaking to the fact that good plowing is a necessity if the best results for their efforts are to be obtained. It seems strange when I think of it, that we hear so little about good plowing. The agricultural papers are silent and even our farmers' institutes have been dumb on the subject. Other implements are spoken of and their fine points praised, but the implement upon which we most depend; the one upon which the world depends for its bread, is left unmentioned. The only reason that I can see for this is that there are so few who know anything about good plowing. I feel safe in saying that there is only about one man out of every thousand who knows what good plowing is.

I have asked different men who live in a vicinity where plowing matches have been held annually for the last 25 years, what they know about plowing and what good plowing is, and only a few have given me a satisfactory answer. What is good plowing? I should say, good plowing consists in turning and setting the soil into nice, neat, even, clean, round, straight furrows, so that the under soil will be brought up as much as possible and exposed to the sun and atmosphere. What do I mean by clean furrows? Having the weeds, stubble and grass all turned under and cutting a clean land-side. Even? Having the furrows all of the same height. Round? So that the furrows will show only a little crease between, and, unless you plow straight, your furrows will not be even. Some may think that a certain width and depth are necessary in good plowing, and it is. We might say, regulate the width by the depth, but there are so many different shaped mould-boards which throw the soil into different positions, that some would need to cut wide furrows and others narrow. Not only that, but some soil needs shallow plowing while other deep plowing in order to produce the best yield. I might tell you that I plow a certain width and depth and get good results, but this might not apply on all farms, as a rule. You might try the same depth and width with poor results. We have found in our plowing matches that one-fourth of an inch in either width or depth makes a great deal of difference in doing good work. Every farmer must know what depth will apply to his own farm. If he plows shallow he should set his plow so that it will not cut so wide as it should when he plows deep, for then it will not turn the soil so flat.

By long experience, hard study and practice, one will become so accustomed to plows that he will readily see how much soil a plow can handle. We all admit the necessity of plowing and if it is worth doing at all, it is worth doing well.

The first thing a man should know when he begins farming is how to plow, because good plowing is more easily worked up and got ready for planting; weeds are more easily kept down and more corn is raised. The results—more and better corn with less work for having done good plowing. Some one will say, we do not do the good plowing you are speaking of and we get good corn anyway. That may be true, but I do not hesitate to say that you would have had better corn with good plowing.

Several years ago I attended a plowing contest at Ft. Wayne, Ind., where they did beautiful work, but it was not practical. In the first place they had plows imported which were not adapted to this part of the country. The shear was only 8 inches wide; the land-side and mould-board about 4 feet long, while the handles were 10 feet long. Their display was principally in beautiful horses, gaudily decorated with costly mounted harness. Such contests may have good results, but they do not teach the man how to set his plow which he has to use in his own field every day. There is so much poor plowing done that it is hardly necessary to describe it. There are examples of it all around us. Yet, it may be well to speak of some of the reasons for poor plowing. The chief reason is a poor plowman. Why, actually, there are farmers who do not know enough to put a plow into the ground. A certain man purchased a plow and being unable to put it into the ground, reported the fact to the manufacturers. Never having heard of such a case, one of the firm immediately took a train and went about 50 miles to learn what was wrong. Upon arriving at the farm, he at once had the farmer hitch to the plow as he had done before. He raised the third lever which lowered the plows, but the manufacturer told him to lower the frames by the use of another lever. The farmer did so and the plow worked all right. This was not a Will county farmer, but it is a true occurance nevertheless.

The man behind the plow must be something more than a mere machine. He should have brain as well as muscle, for it requires watchfulness in more places than most people think, to regulate the plow of today. Why have we so many poor plowman? It is because the boys are not taught to plow. They are not educated to good plowing. They know nothing about good plowing. A man will send his hired man or boys to the field to plow and then never go near them to see whether they are doing good work, or to instruct them. They seem to think that if the ground is stirred up a little that it is good enough. Any way to get through and get the plowing out of the way. But this is a mistake. We should begin to figure on our crops when we begin to plow. You have all heard of the man who raised more corn to feed more hogs, to buy more land to raise more corn, etc. This man should have said, "Do good plowing to raise more corn, to feed more hogs to buy more land," etc.

Another reason for poor plowing is a dull plow. Some men actually let their plows become so dull, that were it not for the weight of the man and the sulky, the plows would slip out of the ground. Not only that but it is very hard for the horses, and, where the ground is hard, the plow will come up out of the ground and leave the plowing uneven. A great many farmers use dull plows and do not know it. To look at the plows, they do not appear so dull, but if you were to set the plow on a board, you will see that the bottom of the shear has the appearance of a sleigh runner. Hence, to get the plow into the ground one would have to raise the heel of the plow so much that it would so displace the mould-board as not to turn a nice furrow. Another fault lies in trying to do too much. Some men actually try to cut a furrow from 18 to 20 inches wide. This leaves the ground too flat and some of it unturned. There is no plow built that will handle so much soil and do it right. It will sometimes happen that the furrow wheel will run on top. In such a case the careless plowman will pull his horses over into place and go on, thus leaving a little space unplowed and a hole in the plowing, which makes it look very bad. All such plowing is unprofitable.

In speaking of plows I want to say, that I refer mostly to gangs, because I feel that this is the plow of today. There is a great choice in plows, but how can a man chose if he does not know what is needed in a plow to do good work. We have some good plows, yet there is room for a great deal of improvement. In doing work one must have a plow that can be adjusted for it. Among the good plows of today, I have not seen one but what a good plowman would have to rebuild and reset parts of it in order to get it into good shape to do real good work.

There are a number of manufacturers who have made a few changes in their plows to suit certain plowmen at the Wheatland plowing match, that is, they made certain changes in the one plow to be used at the match, but the manufacturer will not do this unless it is insisted upon, since this will add to the cost of manufacturing. When we ask the manufacturer why he does not build the plow so that it can be used to do first-class work, he will say: "We are running this institution and Wheatland is the only place where we have calls for such a change. We have no trouble in other parts of the country. Farmers do not ask for a change in our plows." Why is this? Because they have not, and do not, study into the subject, and do not know what is needed in a plow to do first class work. When farmers in general demand needed improvements, the manufacturer must furnish them.

There is a certain plow on the market which is built with its beams on an angle with the plows, which brings the front of the beams about one foot out of line with the plows, so that the evener is hitched at about the center of the beams. This is done to put away with side-draft. All I can say for this is, that it is a talking point. This plow will sell readily because most farmers will believe just what the agent tells them when they say there is no side-draft on this plow, as there is on others. If there is no side-draft on this plow it is because the plows are turned stronger into the land. This can be done with any plow. Any good plowman can take a gang plow and set it so that there will be no side draft; but the plows will then not work so well.

I prefer a sixteen inch plow—a gang—with a sixteen inch mould-board and a fourteen inch share. Most of the fourteen inch plows are too small to handle the soil in Wheatland, and not only are they too small but they are not properly built. At present gangs are built with the rear plow about one-half inch lower than the front one and most of them are set fourteen inches apart and bolted together so solidly that they can not be changed without a hammer and an anvil. Here is where the trouble lies with the gang plow of today. The plows should be coupled so that the width of the furrows can be varied to any fraction of two inches and the rear plow should be so hung to the beam that it can be raised or lowered in a slide about one and one-fourth inches.

In doing good work in Wheatland, most of us use plows that have to be set to cut from twelve and one-half to thirteen inches wide and about six inches deep for each plow. This is enough work for four horses on a gang plow. If the plows gradually come up a little, we have to raise the heel. After getting a plow set as nearly right as possible, learn to drive well, for about one-half of good plowing lies in the driving. Hitch your horses so that they will not spread too much; pick up your lines and drive them abreast, and drive them at a gait which they can stand for a whole day.

There is a great deal of argument on the draft of different plows. Some men seem to think that certain plows run much harder than others. I would not turn my hand over for the difference if the plow is properly set. I could take any plow and very easily set it so that it will run a half horse harder. The trouble lies with the plowman. He does not know how to set his plow. I believe that a man who can set his plow to cut a clean, even, round furrow and lay the soil on, or nearly on, a level with the back-furrows; and who can drive so straight that after having plowed one-half acre the land plowed will not vary more than three inches in width across the field, is rightly called a good plowman. Any boy with a little effort and study while in the field at work with his plow, may become an expert plowman.

The Annual Wheatland Plowing Match has been the training school of many plowmen who will carry thro' life the lessons they have learned there. All that I know about plowing I feel is due to the tireless efforts of the father of the Wheatland plowing match, James Patterson, who through many discouragements which would have caused many a weaker man to give up in despair, has stood by us with his shoulder to the wheel until Wheatland stands a model township in our great commonwealth.

Every township needs such a training school. May the day soon come when the needs of our farmer boys are seen and this part of the farm work encouraged.

How to Secure a Catch of Clover.

[By C. D. Smith, Paris, Ill.]

As we travel over this great State of Illinois and see the broad fields that have been rich in plant-producing foods, that have been capable, in years gone by, of producing as large crops as any fields in any state in the union, it looks gloomy indeed to think of these same fields now retrograding.

In the beginning God created the heaven and the earth. In all the universe everything fills its mission. No animal has God created but likewise has He created its food. Every plant that grows on the earth likewise is adapted to the soil on which it grows, and is suited for a purpose. Some impoverish the soil. Others replenish and build it up.

We are situated in the great corn belt of the world. Nowhere else is corn king as here. But corn is hard on the soil on which it grows. It wears it out. But God has also given us a plant alike adapted to this sphere and clime, with a mission to build up this land impoverished by the corn plant. He has given us the clover, a plant that is qualified to take from the air and restore in the soil those ingredients used by the corn.

When we stop to consider, we know that corn is king; that all other cereals make obeisance to king corn; that this king corn is grown only in a very small portion of the world, and that we live in the very heart of this corn belt. You can count the states on your fingers that are included in it Then we look about us and see that corn is hard on land. It exhausts it. Fields planted to corn for several years in succession lose their fertility. Land continually planted to corn would, in time, become, as the worn out farms in the eastern states, worthless. And we can see that this continual cropping to corn is telling on our own farms. We must adopt some plan by which we can keep the fertliity on our farms.

Then when we consider we know that clover will build up our farms; that it will renovate these fields that are growing our crops of corn; that clover above all other plants, will do more to produce large crops of corn than anything else the farmer can grow; that if he will rotate his corn with clover, the corn will be better, the land will become more fertile, and instead of becoming worthless as the abandoned farms of New England, they will become as fertile as the fabled valleys of the Nile. Should we then not bend every energy to the growing of clover? If it is the one thing that is not a drain on our land, should we not put forth every laudable effort to secure a stand?

In any community in this county you may find farm after farm that will not produce crops today as they did years ago, when they should have been growing better had they had the proper treatment. Wherever you may go you will find farms and farmers who enjoy the same sunshine and the same showers, one farm will be improving and the other retrograding. One farmer will be making money and growing good crops, while his neighbor's farm is retrograding, and its tenant bemoans his bad luck. Ask the farmer who is prospering, why it is so, and he will not tell you that he grows corn on the same field for many years in succession. He will tell you that he rotates his crop, and clover is the prominent one in his rotation. Then go to the other farmer whose farm is running down, and whose crops are diminishing from year to year. Ask him why it is so, and he will tell you that clover is not in his curriculum. He grows corn. He has a farm that he is exhausting its soil fertility, and he makes no effort to build it up. Ask him about growing clover, and he will tell you possibly, that he can not secure a catch. Question him further, and you wiil find that the method he follows to secure a catch is of a slip-shod manner, the same as are his habits in farming.

Yet we know some men who are otherwise the best of farmers, but are failures when it comes to securing a catch of clover. They sow clover often and keep trying, but only once in a while secure a catch. They are industrious, good managers and hustle, and you would call them model farmers, but they are failures when it comes to a certainty of securing a catch of clover.

You also know a class of farmers who are dependent entirely upon the weather for their catch of clover. They will make these expressions: "If the weather is favorable when I cut my oats the clover will be all right." "If there comes a good rain just after harvesting the nurse crop the clover will not die." "But if the weather is dry and the sun shines hot it is sure death to the clover." They sow their clover seed and depend on a rain to cover it. They sow their oats thick and depend on cloudy weather and rain to save the clover when the oats are harvested. They are at the mercy of the weather, and the man that must depend on these uncertainties will never make a success of growing clover.

To all such I wish to say you are overlooking the fundamental principle of the clover problem. You have unconsciously been causing your own failures. You have not recognized the fact that the clover plant must have the sunshine from the time the seed is sown until the nurse crop is harvested. You have unconsciously been growing your clover in the shade. You have been sowing it with a nurse crop that shades it until that nurse crop is harvested, and then if there comes a rain the clover will in all probability live and make a stand. And that is the year in which you have secured a catch. But in all likelihood the seasons that have been unfavorable to the clover at the time of cutting the nurse crop have been in the majority, and you have had more failures than successes.

There is not that uncertainty of a stand of anything else which the farmer grows that there is of a catch of clover. He sows his oats, his wheat, plants his corn and potatoes, confidently expecting them to grow and to yield a harvest. But there is an element of uncertainty in the securing of a catch of clover that there ought not to be. It is possible to sow clover in such a way that you may be just as sure of a catch as you are sure of a stand of corn when you plant it. Something is wrong somewhere in the methods that maintain on the farm on which a catch of clover can not be secured.

It has been said, and that truly, that the keynote to the clover problem, and the one that needs most discussion, is how to secure a catch. Farmers know its worth. They know its great value as a feed and fertilizer. But how to secure a good catch is a subject with which they are not well acquainted.

Before I proceed further I wish to say that in the discussion of this subject I will simply give you my experience. I am not advancing theories that have not been tried. I am a farmer as are most of you, I presume. I have lived on a farm all my life. I have grown clover and made it a study for the past ten years, and during that time I have not made a single failure when sown in the way I shall recommend you to do.

Then in considering this subject it will be necessary for me to tell you how I sow my oats in connection with my way of securing a catch of clover, because I sow my clover seed when I sow my oats. I sow both at once and it depends altogether how the oats are sown whether you can be sure of a catch of clover.

It is my custom to follow corn with oats and clover. Then the first thing to look after is the preparation of the seed bed. If the corn has been husked in the field and the stalks left standing, the first thing to be done is to break the stalks when the ground is frozen solid, thus leaving the stubs in the ground. Then when the time comes to sow oats, and the ground is in good condition to work, rake and burn the stalks. We use the drill in sowing the oats and clover, and it will not work well in the stalks, therefore it is necessary to get rid of them. To secure a good catch of clover is worth more than the corn stalks, if by leaving them on the ground they cause us to lose the catch of clover.

As soon as the ground is cleared of stalks it is ready to receive the seed. You can not improve it by discing or plowing. What clover, and oats for that matter, most need is a solid seed bed. This you have already without doing any more work. Use a good two-horse wheat drill and sow the oats and clover. Use the grass seed attachment on the drill for sowing the clover. The clover seed falls in front of the drill hoes and is covered by them. The oats fall through the rubber hose into the furrows made by the drill points. Follow the drill with a smoothing harrow to cover any seed that the drill may fail to cover and also to level the ground. Some may doubt the possibility of using the drill on corn stalk stubble ground without first preparing it in some way. But it works well. It does good work.

This, in a nutshell, is my method of securing a catch of clover, and I think it has many points of superiority. I have tried many different plans, but have found none that gives as good results as this one. In the first place it distributes the seed very evenly over the ground. There are no thick patches and no thin ones. It is the same all over the field. So many times we see fields that are streaked. There will be a streak that is very thick, then one that is very thin. Then if the clover seed is sown the same as the oats it will also be streaked, for where the oats are the thickest the chances are that the clover will die when the oats are harvested and the clover, where the oats are thin, will live. But when the drill is used the stand is even all over the field.

In the second place the quantity of seed sown can be regulated exactly. True, this may be done in other ways too, but one thing that prevents very many from securing a catch of clover, by sowing it with oats as a nurse crop, is because they sow too many oats. I sow, and would recommend this amount where you wish to secure a catch of clover, not more than one bushel of oats to the acre, and a bushel of clover seed to five acres. If good seed, well cleaned and graded, is used, and is sown with the drill, this amount will produce a good crop of oats and a good stand of clover.

Farmers want to grow as large a crop as possible of whatever they sow, whether it be corn, wheat or oats, and this is right. We should all strive to do the very best we can. But when we are trying to secure a catch of clover, it must have the first chance. It seems to be the general impression that the more oats we sow the larger will be the yield. I don't know how that impression got such a hold on the farmers, but it has. We don't follow that same theory in planting corn. Just as well plant a bushel of corn on three or four acres instead of eight as to sow three or four bushels of oats to the acre. One stalk of corn with two big ears is worth more than four stalks with four small nubbins. One stalk of oats with 100 grains is worth as much as four stalks with 25 grains each. It is possible to grow almost as many bushels of oats from one bushel of seed sown to the acre, if it is properly sown, as it is if three or four bushels are sown. Why not use the same judgment in sowing oats that we do in planting corn? In planting corn we will be very careful to get just two or three grains to the hill. The corn planter manufacturers go to a great expense exhibiting their machines at the fairs to show that their planters will drop a certain number of grains each time and not fail. And that is the kind of a planter we will buy. But, when we sow oats as a nurse crop for clover, we will sow three or four or five grains where we ought to have but one. Two years ago a near neighbor threshed 70 bushels of oats to the acre from less than a bushel of seed sown. You may say that is an exception. So it is. It is also an exception when you thresh 70 bushels to the acre when three or four bushels of seed is sown. Now this may seem foreign to the question, but so many fail to secure a stand of clover because they smother oats too thick that I have endeavored to show that it does not necessarily require a thick seeding of oats to produce a large crop, and that it is the thick seeding that kills the clover.

In the third place the drill plants the oats in rows eight inches apart, and distributes the clover seed all over the ground. Now it is very important that these rows run north and south, but it may, at first thought, seem a small matter. If you will take time to consider this point you will see that herein lies one of the greatest advantages in securing a catch of clover by using the drill! Aside from sowing the oats thin, this matter of running the drill north and south is next in importance.

The time that nine-tenths of the young clover is killed is just after the nurse crop is harvested, and it is killed by the sun, the very thing that ought to make it grow, for the nurse crop has ceased to draw on the moisture that is in the soil. Those of you who read agricultural papers have seen many articles in them on the topic of how to secure a catch of clover. You can hardly pick up one of these papers unless you can see clover discussed in some of its phases. A great many of the contributors, and among them the best agricultural writers in the world, recommend the harvesting of the oats for hay. By this they mean the cutting of the oats before they are ripe, claiming thereby to lessen the chances of the clover being killed, when the oats are harvested. That the oats in the process of ripening require a great amount of water to mature them, and that by the oats requiring this great amount of water it robs the clover, therefore it dies. I used to believe this theory but now I believe it is only a theory. Don't understand me to say that clover never dies while oats are in the process of ripening. It does very often. But it is not because the oats sap all the moisture out of the ground. What difference does it make with the clover, whether the oats are green or ripe, when the oats are harvested. If the sun shines hot when the oats are harvested, it will burn the clover, just the same, whether the oats are green or ripe. I will make this assertion, that the absorbing of the water from the ground, by the oats in the process of ripening, never killed a field of clover. Now I realize that that is a broad statement and that it is contrary to the recommendation of the experiment stations. In that statement, I realize that I am opposed by almost every speaker on the platform, that discusses the clover problem. But be that as it may, I belive they are wrong in their theory.

In the first place oats is a surface feeder and draws its moisture principally from near the surface. Clover is a subsurface feeder and draws its water from the subsoil. But the oats being sown thick, and they grow so much taller than the clover, forms a shade, and the clover is choked out, or if not entirely killed by the time the oats are harvested, the plants are not in a condition to stand the heat of the sun, whether the oats are green or ripe when they are harvested. If the clover dies before the oats are harvested it is because the oats are so thick that they smother the young clover. If the clover dies immediately after the oats are harvested, it is the sun that kills it.

Doubtless many of you, on the day you harvested your oats, have had a fine stand of clover and in three days every spear of it was dead. If the oats sapped the moisture from the clover and killed it, it would have died before the oats were harvested. But instead the clover apparently was all right when the oats were harvested. The oats ceased to draw moisture from the ground immediately on being cut, hence the moisture in the ground could all be utilized by the clover, and it had more moisture to draw on when it died than when the oats were harvested, because the oats had been helping to exhaust the moisture from the soil. This they were not doing when the clover died.

If it had been cloudy or rainy, when the oats were harvested, the chances would have been favorable to the clover and it would have made a good stand. But this is the very thing with which we have to contend. If we each had the ordering of the weather on our farms, we could favor our clover with showers and cloudy weather, and thus save it. But this we do not have, so we must adopt a plan that will suit the unfavorable weather. Then if we can hit on a plan that is sure to succeed in unfavorable weather, that is the one to follow, for it will also succeed in favorable weather as well.

Again, did you ever notice a place in the field where the oats were thin and the young clover could get the sunshine, that the clover was killed by the oats sapping the moisture away from it? Did you ever see a place in the field where the oats were thin that the clover was killed by the sun after the oats were harvested? You never saw it killed that way. If the oats are sown so the young clover has the sunshine the oats may stand until they are dead ripe and you will never see that clover killed. You can never tell any difference in the growth of the clover either before or after harvest, or while the oats are ripening.

What the clover needs and must have is the sunshine. Drill the oats east and west and the clover is continually in the shade, except a little while in the morning and evening, when the sun does not have much force. But drill the oats north and south, and the clover gets the benefit of the sunshine in the middle of the day when it is the hottest. The sun shines down directly on the young clover plants between these drill rows and thus develops strong and hardy plants. Then by the clover plants having this sunshine all along they are made strong and are not affected by the sun when the nurse crop is harvested. It does not need a rain and cloudy weather to keep the sun from killing it.

Now this burning of the young clover by the sun at the time of harvesting the nurse crop, is one of the most important things against which we must guard. It is the point at which so many fail. They can sow the seed and cover it, and it will start off all right, until the nurse crop is harvested, and the sun shines on the young clover a day or two, very hot, and it is all gone like a June frost. But as I have said the trouble lies in the way the nurse crop is sown. While the nurse crop has the sunshine, the young clover must also have it. The nurse crop must not be allowed to shade the young clover plants and make them tender. Clover is one of the best drouth resisters we have. Dry weather will not kill it, but the sun will, if it is made tender with a nurse crop.

Then again, by this method the oats and clover are sown of an even depth. The seed is placed in the moist dirt and covered with the same kind of dirt. This point is very often overlooked, especially with clover and grass seed. Very often they are sown on top of the ground and trusted to a rain covering the seed. Some are afraid of covering it too deep but more often it is not covered deep enough. I knew a farmer a few years ago who wanted to grow some clover. He undertook to do so, by sowing it with oats as a nurse crop. He first sowed the oats broadcast and harrowed them in. Then a good heavy rain came and beat the ground down solid. In about two weeks after sowing the oats he sowed the clover seed on top of the ground and trusted to a rain covering it. But the rain did not come and he is wondering to this day why he did not secure a catch of clover.

And yet if we would take the trouble to inquire into the methods followed by the farmers who have so many failures, they would probably be just as reasonable as this one.

Again, it is profitable to use the drill in the point of labor saved. The oats and clover are sown at the same time. They are both covered and the work is completed in one operation. The drill hoes work like so many little plows and at the same time that it plows it sows the seed and covers it. When you quit work at night you are not worried about the weather. If it comes a rain you havn't a lot of seed sown that the work is not completed. But it is finished as you go. What is done is done.

Other points might be given in favor of this method of securing a catch of clover, but suffice it to say that some years anyone can secure a catch. Any method will bring good results. But there come seasons in which most of the methods used in favorable years, will fail. So what we need to know is a method on which we can depend whether the season is favorable or otherwise. A way that is good for these off years. A way in which we can be reasonably certain in any season.

I know that if farmers will use the drill and sow their oats thin, and sow plenty of clover seed and run the drill north and south, they will not have any failures to secure a catch.

Take pains to do the work well. "What is worth doing is worth doing well." The clover problem is a momentous question. We must sow clover to hold the fertility in our farms.

To secure a good catch of clover is more important than the whole oat crop. You can better afford to lose the oats than a stand of clover. If you received no oats in return by sowing them thin, but a good catch of clover, it is better than to sow the oats thick and lose the clover from year to year. But that is not necessary. The thin seeding of oats, if properly done, will yield almost as many bushels to the acre as the thick seeding.

On this high priced land we must farm it for all it is worth. But in doing this we must be sure we do not follow mistaken economy. If we follow a plan to secure a catch of clover in which we continually fail, it is certainly not economy to continue in that line. If we are sowing three or four bushels of oats to the acre and sowing clover seed with it and fail to get a catch, except occasionally, is it policy to continue to do so? If we can sow one bushel of oats to the acre and receive in return almost as many bushels as when we sow three or four, is it economy to waste the extra amount of seed? Now, if one bushel of oats will produce almost as many bushels to the acre when sown with the drill as three or four bushels sown in other ways, is it not policy to use the drill? Not only that, but if we can use the drill and be sure of a catch of clover, is it not policy to use it? If we can run the drill north and south and give the clover a better advantage than to run it east and west, is it not better to do so? But you say you havn't a drill; then hire one or better still buy one. It is false economy to make that excuse when you are losing every year by your failure to secure a catch of clover, far more than what a drill would cost. Did you ever count the cost of a failure to secure a catch of clover? It is not measured in dollars and cents for the amount the seed cost. The loss in fertility to the land is far greater than the loss of the seed. But it is economy to study this question and leave no stone unturned by which you may improve your farm. There is nothing that will help to do so like clover; then it is necessary that we understand how to secure a catch. This clover problem is too great a question to be trifled with. We need the clover and must have it. Doubtless there are men within the sound of my voice who have failed year after year to secure a stand of clover, and yet they go on in the same old rut, not thinking of their great loss. Is it any wonder, when we consider the great number of failures in securing a catch of clover, that men quit trying? I want to say that I have tried this plan. I know it will succeed and can recommend it to any one wishing to grow clover.

To those of you who have been failing to secure a catch of clover, let me say in conclusion, try this method. This winter break your stalks when the ground is frozen. Begin early to lay your plans to carry out these directions. In the spring when the ground gets in good condition to work rake your stalks and burn them. Let the ground get dry enough to work well. Do not work it wet. Get the ground as clean of trash as you can. The cleaner the better. Also clean your oats with a fan; have your seed in prime condition. Do the same with the clover seed. Use the very best seed money will buy. Then use a good two-horse wheat drill. If you havn't one, rent one. If you can not rent one, buy one. But by all means use the drill if you are interested enough in clover to really want a stand. Set the drill to sow one bushel of oats to the acre and the grass seeder to sow a bushel of clover seed to five acres. Don't sow only when the ground is in good condition to work. Better wait until almost the first of May than to sow in wet ground. But sow the last few days in March or the first few days in April, if possible. Drive the drill north and south. Don't sow it east and west. You might possibly get a stand by sowing it east and west, but the chances are against you. You might sow it broadcast and get just as good a stand as to use the drill if the season proved favorable for that way of seeding. But you don't know what kind of a season you will have. Use the drill and you will be sure of a stand of clover no matter what kind of a season is before you. After sowing the oats and clover, keep it harrowed close up to the drill. Work the ground while it is moist and get it thoroughly pulverized.

If you sow your clover in this manner you can let your oats get ripe before cutting, or you can make hay out of them. But whichever you do, you may be sure of a catch of clover.

HORSE DEPARTMENT.

[Paper on the Horse by W. S. Hicks, Warren.]

In a nutshell, my advice to the farmer is to raise the horse that will raise the most money and thereby raise the mortgage on the old farm the quickest. In other words, raise the horse for which there is a demand. If you gain a reputation for producing horses that are wanted, buyers will seek your stables and prices will soon become a secondary matter.

The successful horse raiser today is the one who reads the trade journals and market reports, thereby keeping himself constantly posted upon the classes of horses which are wanted, and for which the best prices are paid.

Do not understand me to mean that your reputation will sell your horses. Far from it; your reputation will, however, attract many buyers, but you must have the genuine animals to show them—the kind they want.

The question now arises, what kind of horses are in demand and bring the best prices?

Were ten men asked this question, each would doubtless give a different answer.

Mr. A. believes in raising common horses, weighing from 1,100 to 1,200 pounds, which he can work on the farm or drive to town.

Mr. B. thinks coach horses are the only kind to raise because he had good luck in disposing of several.

Mr. C. is rather eccentric, he never made so much money in his life as when he kept four or five old plugs to do his farm work,and raised Shetland ponies, which sold for $75 to $200 each. And thus the replies would continue to vary.

During the last 35 years I have sold in round numbers 600 horses, nearly all kinds and prices. This experience, part of which has been well paid for, tells me that the horse to raise for money making purposes is the draft horse, Norman, Clydesdale or English Shire, according to taste. There is a constant demand for heavy draft horses, and barb wire scars or small blemishes do not materially lower the prices. Moreover, they are the easiest horses to raise, the most readily broken and of the most service on the farm, for they can be worked at 3 years of age, and thereafter will more than earn their board until developed and ready for the market.

Please do not interpret my draft horse as a big, overgrown, awkward and clumsy piece of horseflesh. Give me the drafter weighing 1,600 to 1,800 pounds, fair height, short coupled, with plenty of life, style and action—one that is capable of striking a 4-minute gait. That's the horse for me, the one the buyer wants, and the animal that brings from $150 to $225.

If you desire to engage in horse raising somewhat extensively be sure to "breed in line." That is, first decide upon your breed—Clydesdale, Norman or English Shire—then use nothing but thoroughbred sires and stick to that one breed. In ten years you will be surprised at the progress you have made and will be pleased with the fine herd of horses which you have built up. You will no longer be required to hunt buyers, they will seek you.

Should you desire to accomplish better results in one-half or two-thirds the time, pay $400 to $600 for a team of fine 3-year old thoroughbred mares. In five years the original investment will appear to you not extravagance, but economy.

A boy who desires to become a doctor should not be compelled to study law. Neither must a farmer hating draft horses feel obliged to raise them. For him there is another class which can be made nearly as profitable. I refer to the coach horse. The ideal coacher is the result of a cross between a clean-boned, stylish draft mare and a finely bred thoroughbred running horse. The draft blood gives the bone and the thoroughbred stock begets stamina and endurance.

This is the horse that has the honor of pulling the regal carriages of the world, and prancing upon the pavement proudly champs his bit, while waiting for his royal masters to enter the carriage.

Making a brief tour of England in 1870, I had the pleasure of being shown through the queen's stables, and there saw 32 beautiful bay mares weighing from 1,300 to 1,350 pounds. They were bred as I have described the ideal coach horse, and were three crosses distant from the original draft and running stock.

Sires of similar breeding are at present quite numerous in this country and farmers may obtain fairly good results by crossing with native draft mares of good breeding. They should not expect, however, over 10 per cent of their colts to develop into high-priced coach horses.

You know breeders of trotting horses find by experience that only one colt in 32 proves to be first-class. But in the raising of coach horses, probably one in ten will bring considerable above the average price. The remaing 90 per cent will include "chunks" for city buses, general purpose horses for eastern farmers, cavalry horses and common drivers.

Should you make a business of raising coach horses, you will need to break them well and they may be disposed of in the markets at from $75 to $300 each, only a few at the top price, however.

Though there are occasional ups and downs, the western farmer has reason to feel encouraged in the horse business. Electric cars and carriages do not appear to effect the city demand. Eastern farmers do not raise one-tenth the horses they need, and foreign countries are calling for increased numbers each year.

In 1896 only 25,000 were exported, while last year three times that number were sent abroad, showing an increase of 200 per cent in five years.

During the past five years nearly $40,000,000 has been sent across the Atlantic to the United States in exchange for horses.

Today John Bull has agents in this country with orders to buy 50,000 horses for service in Africa.

The horse is one of man's best friends and has come to stay. But breeders should bear in mind that simple rule: "Raise the horse that is wanted."

DISEASES OF THE DIGESTIVE ORGANS OF THE HORSE.

[Prof. Donald McIntosh, V. S.]

MR. PRESIDENT, LADIES AND GENTLEMEN—I came here to talk to you a short time on the digestive organs of the horse. The reason I took this is because more horses die from diseases of the digestive organs than anything else. I will give you a description of the stomach of the horse. The stomach of the horse is very small in comparison with his body. The stomach is made up of three separate coats of muscular fiber. The first set runs longitudinally; the second in a circle, and the third in an oblique direction. The reason is so the stomach can be contracted in three different ways, allowing three motions, so the foods entering the stomach will be brought in contact with the gastric juice. The organs of digestion are on the right side of the stomach while the left side is lined with a skinny coat and is not very sensitive. We find in this left side is where the botts inhabit.

After the food is digested it passes into the intestines. Both the stomach and intestines of the horse are more largely supplied with blood vessels and nerves, which make these organs much more sensitive, more easily deranged than in cattle. That is the reason we have so much trouble with colic. Animals that are liberally fed are likely to have some disturbance of the digestive apparatus.

In the spring we work the horse too hard and feed him too heavily and we find colic much more common. The best thing is to feed them solid food. Horses do not stand rough food, it is apt to set up a great deal of disturbance. Good clover hay and oats are best for your horse; oats is better than corn. Corn will keep them fat, but oats will make them spirited and strong. The method to follow in feeding horses that are worked hard in the spring is to put them in the stable and give them a little hay. Let them eat that for ten or fifteen minutes, then water them and give them a little oats. The reason for this is, if you put the horse in and give him oats and corn, he is hungry and eats too fast. If you water your horse after eating it washes the food into the intestines before it is digested. We should be careful to feed our horses regularly and not too much. Feeding the horse when he is exhausted will produce colic. The best treatment for such cases of colic is to give the horse all the water he can drink; if he won't drink water pour down him all you possibly can, which will wash the food into the intestines and relieve him.

Medicine is of little importance at this time. When the pain is very severe possibly you can give some medicine that will assist in allaying the pain. The best medicine in this case is extract of belladona and linseed oil. It is not always possible to wash out enough to relieve the stomach.

It is seldom that the veterinary finds that the botts do the horse any harm. It is the larvae which they deposit on the legs, neck and flanks of the horse. The larvae hatch and the horse licks the skin and they find their way into the stomach. They fasten themselves to the stomach, as I told you, and they stick there. There is no remedy, we think, for destroying the botts.

The disease known as spasmodic colic is a disease common with the horse. While it is not fatal, it often causes conditions that cause death. The way you can tell spasmodic colic from the other is, the animal may have spells of ease. He will be easy for a few moments and then begin to roll again. Ordinarily ginger and soda will help it; hot water will help.

The worst form of colic is bloating. This is caused by indigestion, fermentation and the forming of gas. The best remedy we have to use internally is aromatic spirits of ammonia. It should be given in about a pint of warm water; also injections of oil of turpentine are very good.

One of the most common causes of colic is green grass. Horses that are working and turned out to eat a large quantity of grass are likely to be affected with colic. In turning horses out to grass in the spring only a small quantity should be given. After they are accustomed to it there is little danger of doing the horse any harm.

Founder is the result of a deranged stomach. One of the principal causes is the animal getting water when he is hot or exhausted.

Heaves is another thing you can prevent in the horse. Heaves is caused by indigestion. Some think clover hay causes it. It has nothing to do with it. If you are feeding your horse musty hay it is liable to set up indigestion and this will probably produce the heaves. Clover hay will never produce heaves.

If a horse gets too much grain I would let him stand in the stable quite a while and digestion may possibly go on.

HORTICULTURAL DEPARTMENT.

THE SELECTION AND CARE OF FRUIT TREES.

[By E. H. Riehl, Alton, at Madison County Farmers' Institute.]

The subject before us is of vast importance, both to the professional fruit growers and to those who would have a continuous supply of the healthiest and most wholesome food this earth can produce. It is truly a pity that so many families in the country have little or no fruit, when with so little expense they might have an abundant supply. This condition is brought about mainly by traveling tree agents, who sell worthless trees at exhorbitant prices. Naturally the purchaser becomes disgusted and decides that buying trees is a poor investment.

There is something fascinating about new fruit, it is true, but to get a strange variety from a strange man is very risky business. Better get some of the old reliable varieties, and if to make your collection more interesting you wish to try something new, go to a reliable man who has a well-established business and can not afford to lose his good reputation.

Always select young, vigorous trees. Anything else is dear as a gift. For the family orchard it is important to select a list of varieties that will furnish a continuous succession of fruit from beginning to end of the season. The following list is a good one for the home supply, or where fruit is grown in connection with market garden, as in either case a long, continuous list is wanted:

Peaches—Sneed, Greensboro, Alton, Champion, Elberta, Mathew's Beauty, Old Mixon Tree, Smock, Heath Cling, Picquet's Late and Salway.

Apples—Early Lippincott, Colton, McMahon's White, Keswick Coddling, Balley's Sweet, Grimes' Golden, Johnathan, Ingram, Stayman, Winter May and Ben Davis.

Pears—Bloodgood, Tyson, Bonssock, Seckel, Howell, Duchess and Kieffer.

Plums—Wild Goose, Ogan, Shiro-Smomo, Abundance, Chabot, Gold and Shropshire Damson.

Cherries—Sour: Early and Late Richmond, May Duke, English Morrello and Large Montmorency; sweet: Yellow Spanish, Carnation, Napoleon and Windsor.

Quince—Orange is a good reliable variety and a favorite everywhere.

Those interested in persimmons should try the Early Golden. From all accounts it seems to be the best variety yet produced and the only one that is extensively propagated and planted in this part of the country.

In planting a commercial orchard it is not wise as a rule to have a long list of varieties. A good plan is to find out which one, two or three varieties are most profitable with nearby growers and select accordingly. Among Commercial fruits there are what might be called the three kings, namely: Ben Davis apples, Elberta peach, and Kieffer pear. These have in the past been the great money makers, and while they bid fair to continue so for a while there is a likelihood of their being crowded out by other varieties of better quality, as they are all deficient in this regard. In other words it is a question whether or not growers are wise in planting these three leaders so extensively.

Another point worthy of mention is that those who depend on ordinary farm crops and wish to grow fruit for market, should be careful to select varieties that ripen at a time when they are not crowded with other important work. Pruning is of vast importance and should begin when the tree is planted. All trees should have an annual visit by a judicious pruner; *i. e.*, a man who is an observer of nature, who knows when he cuts off a limb what the result will be, or what growth will result thereby; in other words he should be able to know about how the tree will look a year hence. Apple trees require but little pruning if done in time. About all that is necessary is to head the tree properly and remove interfering limbs and suckers. Peaches require a great deal of attention in this respect. Trees should be kept open in the center. The limbs should be encouraged to grow out as nearly horizontal as possible, the object being to prevent abrupt crotches. When trees are large enough to bear they should be topped back each year. About one-third of the previous summer's growth should be removed. Plums stand pruning well and should have it. Cherries do not take kindly to such treatment. Pears also should, as a rule, be pruned sparingly, though in the case of the Kieffer it is sometimes necessary to remove considerable wood in order to be able to get around under the trees and reach the fruit in the tops. Quinces can stand considerable pruning and should have it, lest they present the appearance of a brush pile; not an uncommon sight where quinces are grown.

Cultivation is perhaps most important of all. Not a season should pass after an orchard is planted that the soil is not thoroughly stirred. Many are tempted to grow grain in their orchards; this can be done, of course, but in doing so the sacrifice will in the end overbalance the gain. All things considered, the cow-pea is the best paying crop that can be grown between trees. They make excellent hay, lots of it, and leave the soil richer than it was before.

SPRAYING.

Practical growers who have followed up this work thoroughly are convinced that it is the only way that a crop of perfect apples can be procured. Pears, too, are greatly benefited by spraying, and without it we have no assurance of getting good, smooth fruit. The first application, consisting of Bordeaux mixtures, should occur about the time that buds begin to push; the next, and most important of all, just after petals fall—solution Bordeaux mixture, to which is added a little Paris green. At this time great care should be taken to get some of the poison into the calyx of every apple. The larvæ of the codling moth or apple worm invariably enters the apple at the calyx; hence the object in getting the poison to that vital spot. From this time forward I would recommend for orchards that have not been carefully sprayed in the past, an application every ten days until the fruit begins to ripen.

Use Bordeaux mixture for scab and other fungi, with Paris green for a later hatch of codling moth, canker worm and other insects. The above applies to bearing trees with the supposition that orchards have not had proper attention in this regard in the past. Had the trees received one or two good sprayings annually from the time they were planted until they began to bear, the crop could be saved with less spraying. Furthermore this work will never be a complete success until it is universally practiced. In other words, a man can not expect the best results from spraying while his next door neighbor is breeding fungi and insects by the score.

The selection of a sprayer is largely a matter of choice, as there are many good ones. In selecting, however, it is well to consider the points; Good pressure, easy conveyance and a nozzle that can be easily and quickly cleaned, that will produce a fine mist-like spray.

When it comes to stone fruits, spraying is not a success, for the reason that the curculio can not be affected thereby, and that to spray for fungi the foliage is too delicate to stand a spray of sufficient strength to have a beneficial effect, hence we must look for other methods of saving fruits of this class. The curculio and fungi, a dreaded foe to these fruits, may be held in check in various ways. They may be captured by means of jarring the tree early in the morning, causing them to drop from the tree onto canvas spread below, gathered up and destroyed. But while this method has been successfully practiced by some growers it is not generally practical. The following hints if rightly observed will be found very beneficial: Gather up and destroy all fallen fruit. Pasture to hogs under favorable circumstances, with the precaution not to have too many hogs per acre. Select varieties of peaches of a downy nature, providing they have other good qualities, as the curculio objects to fuzz. Plant plum trees near the house, or better still, in the poultry yard. Cherries, too, should be near the house, not only because the poultry will greatly reduce the insects, but because the birds can be more easily kept at bay.

Last, but not least, grub out all wild crab and plum trees, as they furnish the best breeding place for the curculio.

In conclusion, I will say that were fruit as easily produced today as it was 20 years ago, there would no doubt be an overproduction. But the time is now at hand when the fellow whose idea of fruit growing consists merely of planting a tree and gathering the fruit must take a back seat and make way for the practical man who is not afraid of competition, knowing that his products will be eagerly sought for in spite of the fact that the markets are annually flooded with inferior fruit.

SMALL FRUITS.

[By Prof. J. C. Blair, horticulturist of the Illinois College of Agriculture, delivered at the McLean County Farmers' Institute.]

The small fruit plantation is an important adjunct to every successfully operated farm, for who is there, who would be without the strawberry, raspberry and blackberry in season, and canned fruit of this kind for the long winter months. And yet it is a deplorable fact that most farmers give little or no attention to the bush fruits. They are usually planted in neglected areas about the buildings and left to shift for themselves. Much better to have these areas in sod with an occasional shrub than to attempt to grow satisfactory fruit in such places.

THE PROPER PLACE.

Give these small fruits an open area next to the orchrrd, and then extend in long rows, so as to facilitate cultivation with horse machinery and to be easily reached by spraying apparatus. These plants, cultivated in long, straight, rows, will afford pleasure and interest to the farmer, his wife and children, while the occasional bush and strawberry patch in the garden would doubtless be allowed to grow up to weeds.

In speaking of scientific fruits, we can only give a few general principles, allowing the interested farmer to select the many valuable details from the excellent papers and reports contained in the volumes of the Illinois Horticultural society and from other valuable literature on the subject.

STRAWBERRIES.

If the site selected for the small fruit, permits rows eight rods long, at least four of such should be given up to strawberries, providing there is a family of six or eight. This site should have rather heavy subsoil, with preferably a sandy loam for top layer, and should be well drained. Allow these rows of strawberries to be four or four and one-half feet apart, with the plants a foot to 18 inches apart in the rows. Set the plants deeply, but do not allow the dirt to cover the crown of the plant. Cultivate them often, and to a depth of not more than two inches, if possible. Keep the rows as near level as may be, and never allow them to become more than 16 or 18 inches wide. They can be kept within this space by an occasional cutting of the runners with a hoe.

ONLY TWO CROPS.

If the best results are to be obtained and the patch to be kept free from crown miners, white grubs and other pests, then do not attempt to take more than two crops of strawberries from the same area. Shift it to another part of the plantation. Of course, mulching with a little clean straw is imperative, and it should be scattered over the rows as soon as the ground freezes, removing it from the top of the rows when continuous warm weather comes again.

OTHER BERRIES.

Two rows of this same length will be sufficient for blackberries, while three are given up to raspberries and one to currants and gooseberries. Care should be taken to select only those varities which experience has proven hardy and best adapted to the particular location in question. Give the raspberry rows at least six feet apart and plant four feet apart in the row, while the blackberries will be better with rows eight feet apart. The currants and gooseberries will not require as much room as the raspberries, yet they should have a space of at least four or five feet each way.

THE NECESSARY CARE.

Keep all of this area free from weeds, cultivating in the early spring rather deeply and all subsequent cultivations rather shallow. During the winter and early spring remove all dead canes, taking care to burn these. Pinch in the canes when the growth is about half made during each growing season. (See report of Illinois State Horticultural society for 1900, pages 279-282, for detailed account of pruning small fruits.)

Spraying and Caring for Apple Trees.

[By F. D. Linn, Byran, Ill.]

Our section of Illinois is not usually spoken of as an apple producing country in the commercial sense. We may not wish to raise apples for commercial profits, still we owe to ourselves a good supply, and if we depend on the market, we are likely to be without it, or at least, to accept fruit of inferior quality, for no farmer goes to the merchant with the certainty of satisfaction which he would have, could he gather the fruit in his own orchard, where trees yield varieties of his own selection.

A few days ago a neighbor said to me that he had paid to nurserymen a sum which would bear interest sufficient to furnish his family plenty of apples and that he had never gotten returns for either money or work; that he had at one time set eight trees and believed eight apples had been gathered before the last tree died. I did not doubt either statement for I knew that he had made a mistake which is not an uncommon one. We made it once and the result is universally the same, The orchard was used for a calf pasture. In our case, when the trees had died, they were grubbed out, and after farming the land for two years and manuring it heavily, we started a different practice, with the result that we now have a nine year old orchard of thrifty, fruitful trees.

There are a number of good orchards in this neighborhood, and it is in the belief that every Winnebago county farmer can have an orchard that will keep his family well supplied with the best of fruit, and will abundantly repay him for the time and money spent, that I venture to offer these notes. It was my first thought to mention only such operations as have to do with the bearing orchard, but a second was, that unless we give care to earlier management, we can not have bearing trees to deal with.

The first things to be considered in planting an orchard are the selection of a site and the preparation of the soil. The plat should not be so nearly as to allow water to puddle on it. The soil must be rich, and if not naturally so, manure should be applied in such amount as would enable the land to produce a good crop of corn. Plow deep, pulverize thoroughly, level the surface, and the ground is ready for planting.

Now comes a most important step if we are to have a good orchard; the selection and purchase of the stock. We should remember that trees are expected to bear for many years, and should try to deal with a nurseryman whose business integrity will not allow him to fill any order with stock which is not true to name, and which has not been carefully propagated and judiciously handled, so that it may reach the buyer in hardy condition, and insured of thrifty growth. It is well known that the country is often canvassed by tree agents, claiming to represent certain nurseries, who have their orders filled wherever, and by whom it will be done the cheapest. A rule kept inviolate in our buying is never to deal with any foreign nursery. There are plenty of good local nurseries with which any farmer can acquaint himself, and it may be supposed that trees propagated where soil and climate conditions are similar to those in which they are to be grown, will be more hardy, than if the conditions are changed. There is a State law requiring the inspection of nurseries by the official entomologist of the State, to prevent the introduction and distribution of dangerous insects and diseases, and nursery catalogues and agents, should be required to show certificates of inspection by such authority.

The varieties that have proved hardy in our own orchard are Duchess of Oldenburg and Yellow Transparent for summer; Wealthy, Fall Orange, Longfield and Snow for fall; Northwestern Greenings, Romanites, Talman Sweet and Wagner for winter.

If an entire orchard were to be set with Yellow Transparent or Northwestern Greenings, the trees might stand closer together than if Wealthy or Snow or some other varieties having a tendency to spread were planted; however, in a family orchard where several varieties are to be grown, we must plant to accommodate the ones that will spread the most, and 30 feet each way is close enough. In our own orchard the trees stand at that distance, and while they seemed a long way apart when first planted, it is to be seen now that they will be none too close when full growth is reached.

It is not possible when transplanting trees to have them stand exactly as they did in the nursery, as some roots will be broken in lifting, and the direction of growth of some will be changed in setting; but we should aim to give the trees a natural position, and to this end, a hole should be dug two feet in diameter and sufficiently deep to accommodate the roots without crowding. The roots must be cut back to solid wood and the top trimmed down so it will not overtax the crippled root system in the first year's growth. A few shovels full of loose dirt should be thrown on the bottom of the hole, and, after placing the tree, more dirt, to be worked among the roots and firmed with the hands, until the roots are well covered, when the remainder may be tramped solid, except an inch or two on the surface, which it is better to leave loose. In cutting back the top, leave a central leader with lateral branches starting regularly, and at angles not sharply acute, so the tree will develop symetrically and without sharp forks.

If a tree is headed low, the danger of damage by wind is lessened and the fruit is easer gathered, but the tree is harder to cultivate, and this fact requires that when selecting stock, we have in mind the necessity of being able to work freely around the trunks, and see to it that the branches are started sufficiently high as not to interfere.

Now with the young trees planted, what is necessary to give them the growth which must be made before the fruiting period begins? Will they, if left to care for themselves, come to maturity and fruitage as does the young oak or hickory in the forest? Doubtless, some of them would, but there is a law of nature which decrees that the strong survive the weak, and it must be reckoned with, if we would consider the possibility of producing apples by trees which receive no care beyond that of planting. In the forest there is a constant struggle for existence between unlike forms, as well as between the individuals of like forms, and in the unkept orchard, the struggle is no less fierce, or the law less exacting. When we remember that of all the many forest trees and plants which start each spring, but very few develop to maturity, we can understand that a young tree, enfeebled by transplanting, has but little chance for life, if left to battle alone with weeds and grasses which persistently seek the food, moisture and sunlight that are necessary for its growth. Evidently the orchard must be cultivated.

It must not only be thoroughly cultivated during its early years, but throughout its lifetime, if trees are to bear the heaviest crops of the best fruit of which they are capable. What would we think of the farmer who attempted to raise a crop of corn without cultivation! Surely we would predict failure, and yet, how often do we see orchards planted, and immediately, or soon abandoned, so far as cultivation is concerned.

If the orchard is to be cultivated how shall it be done? If any sub crops are to be taken from it what shall they be? These are questions which cannot be answered in the same way for all orchards, nor indeed, can they be answered with certainty for any single orchard. Soil and other conditions vary in different orchards, and at different times in the same orchard, however, some light may be shed on the subject through a consideration of the needs of the trees and of the general effects of cultivation. Trees require from the soil moisture and mineral nutrients. Cultivation allows the circulation of air and water in the soil, which increases the available supply of plant food by decomposing organic matter and rendering insoluble salts soluble. Also it checks evaporation by mulching the surface. Corn culture furnishes a familiar example of this effect, and for it, the orchard must cultivate. If land is kept well manured, trees will suffer little from faulty nutrition, except in so far as it is affected by the water supply. During the hot summer months, large amounts of water are continually given off by the leaves. None is taken in through them; the supply must come through the roots. When the roots are unable to furnish an amount sufficient to maintain the flow; the leaves wilt; the development of the wood and fruit is checked; and in a short time injuries may be inflicted from which the trees will never recover. On the other hand, if strong continuous growth is made throughout the summer, enabling the wood to ripen properly in the fall, the tree goes into the dormant condition strong and hardy and fortified against sudden winter changes. Some fruit growers hold that cultivation should be clean with no attempt to raise sub-crops. That is the ideal method. However, we believe some crops can be raised without endangering the trees. We plant corn, potatoes and garden vegetables. Never until this year has our orchard had anything but a cultivated crop in it. Last spring we sowed oats and clover in the hope of having a crop of clover to turn under next fall, but the clover failed, and next spring the land will be manured and again planted to corn. In no case should the orchard be allowed to sod with blue grass. It not only takes from the soil more moisture than do the cultivated crops, but also furnishes an admirable hiding place for mice and insects, and orchards in sod are usually found to be well stocked with these pests.

In 1890 an experiment was begun at the Illinois experiment station to determine the best method of managing the soil in orchard culture. It was my privilege to follow the experiment in some of the years and no one who has seen the results can doubt the advantages of cultivation. The trees in the clean cultivated plat, and in the plat cropped with corn, were always more thrifty and fruitful than were trees in plats cropped with oats, clover and blue grass. Undoubtedly, thorough, systematic cultivation, or a lack of it, is preëminently the chief factor in determining success or failure in apple culture. But there is also another operation, spraying, that is of no little consequence.

The orchard is continually preyed upon by insects and fungus diseases and their attacks must be resented. There are three standard spraying solutions:

Bordeaux mixture for fungus diseases, Paris green for biting insects, and kerosene emulsion for sucking insects. A knoweledge of the nature of the pests for which they are designed will enable us to use them intelligently. We are all more or less acquainted with various insects which infect the orchard as well as the injuries caused by them. The character of orchard fungi is not generally so well understood, notwithstanding the fact that scaly bark, blighted leaves, and scabby fruit furnish an abundance of these nuisances. They are, in reality, small plants, so small that a magnifier is required to distinguish their parts, which fasten themselves on bark, leaf and fruit and send hairlike branches through and among the outer cells. Not having the power to assimilate inorganic substances their food must all be derived from the host plant. It has also been found, that in their growth, substances are eliminated which are poisonous to the tender tissues that surround them. Their injuries, then, are produced by robbing the affected part of nutriment, creating poisons, and deranging the cells by passing filaments through and among them. They reproduce themselves by the development of seed bodies, called spores, which correspond functionally to the seeds of our common flowering plants.

The fungus with the apple grower has to contend is the apple scab. It affects all parts of the tree, but chiefly the leaves and fruit. It is injury to the latter that fruit growers are quickest to resent. We may see the leaves blighted and killed without evincing great concern, but when the apples fall before they are fairly started, or when they ripen into a gnarly, scabby, worthless lot, we are pretty certain to look for help. That is natural. We should, however, at all times, try to see that the foliage is in healthy condition. It is essential for the life of the tree and we must have in mind the possibility of future crops as well as the desire to produce a good one for the present. We can practically prevent the growth of any of this fungus on our trees and fruit by spraying with a mixture of copper sulphate (blue stone), lime and water. This mixture is known as the Bordeaux mixture. It is a perfect fungicide and is easily prepared, but must be carefully prepared, so that leaves and inmature fruit will not be injured by its use. Its value lies in the fact that it kills the spores and prevents the growth of fungus, but it will not repair damages already done.

Formula for Bordeaux mixture: Copper sulphate (blue stone), six pounds; lime, four pounds; water, 50 gollons.

Put the copper sulphate in a burlap sack and suspend it in six gallons of water. It will require about a day to disolve. Or it may be quickly disolved in two or three gallons of boiling water, but if this is done, enough water should be added to make it up to six gallons. Slake the lime by adding water slowly, and then add enough to make six gallons. Now pour the two solutions at the same time into the pump barrel. This will mix them thoroughly and the lime and vitriol will not be likely to separate. Add sufficient water to make 50 gallons. It is well to pour the two solutions into the barrel through burlap to remove coarse particles which would clog the pump. Copper solutions corrode iron or tin, so it is better to use a wooden vessel for disolving the blue stone. A half barrel is convenient for this purpose. Bordeaux mixture loses its value as a fungicide if allowed to stand for a day or two, so a fresh solution should be made for each application. We make three applications each year; spraying, first, before the buds open; second, just after the flowers have fallen; and third, ten days later.

The most common insect nuisance is the apple worm or codlin moth. The moths appear at the time of blossoming. Each female lays about 50 eggs, depositing them singly in the blossom ends of the fruit. These hatch in six or eight days, and the young worms eat their way to the centers of the apples. They often destroy entire crops by causing the fruit to fall before it has fairly started, but even if apples do not fall, their growth is checked and they are unsightly in appearance and lacking in flavor. By noting the feeding method of these worms, which is biting, we are able to determine means for destroying them, and we find an effectual remedy in Paris green, using four ounces to 50 gallons of water. The trees must be sprayed twice, the first time immediately after the flowers have fallen, and again ten days later. Simply add Paris green to Bordeaux mixture in the same amount as would be required with clean water, and thus spray for insects and fungus in the same operation. Of course, no Paris green is used in the first application of Bordeaux mixture, which is made before the buds open, only in the second and third applications. A very essential thing to do in spraying with Paris green is to first shake it thoroughly with a small quantity of water in a jug or large bottle, as it can not be well mixed if added directly to a large quantity of water or Bordeaux mixture.

It will readily be seen that insects which suck their food from leaf and bark through beaks, will not be affected by applications of Paris green. To this class belong the plant lice and scole insects. Their method of breathing, however, reveals the means to be employed for their destruction. The breathing organs of all insects differ from those of the higher animals. If we look at one of these small lice through a microscope we find a row of openings on either side of the body. These are breathing pores. To kill the insect we have but to apply something which will close up these pores. Diluted kerosene emulsion is usually employed for this purpose.

Formula for kerosene emulsion: Washing soap, half pound; kerosene oil, two gallons; water, one gallon.

To make it disolve one-half pound of washing soap in one gallon of boiling water, add two gallons of kerosene oil, and churn with a force pump until a creamy emulsion is formed. For plant lice, dilute each gallon with 20 gallons of water and apply before the buds start in the spring, or if application is to be made after the buds have started, use one gallon to 20 gallons of water in case of lice. The concentrated solution must in no instance be applied to foliage. Bark lice, infesting small trees, may be easily treated by washing with a brush when the trees are in the dormant condition.

Plant lice do not often occur in such numbers as to cause any considerable injury, but if leaves curl up and wilt in spring or early summer, they should be looked for, and if present, will be usually be found on the under surfaces of the leaves.

If trees are infested with the oyster shell bark louse, it may be detected by the presence of small brown scales, scattered over the bark. These are ellongated and slightly curved, and of two sizes. If one of the larger scales be lifted during winter, it will be found to contain the dead female under one end and a mass of eggs at the other. These eggs hatch in May or early June, and the young lice, after crawling about for a few days, fasten themselves to the bark by their beaks. Here they remain throughout the summer, maturing, forming new scales, and laying more eggs, and all of the time wrestling food from the tree by sucking its juices.

The scales of the scurfy bark louse are whitish and may easily be distinguished from the oyster shell scales by their form, which is oval. The young of this scale attach themselves to the bark as do the young of the oyster shell scale. The scurfy bark louse is more common in orchards than the oyster shell bark louse, but fortunately neither one of them often becomes so numerous on well kept trees as to seriously injure them.

The San José scale, when once established in an orchard, is harder to exterminate and more destructive than any other insect known. So much is it dreaded that large sums of money have been appropriated by the State to prosecute the work of exterminating it under supervision of the official entomologist, and laws have been enacted seeking to prevent its distribution by nurseries. It is true this formidable pest has been discovered in but very few orchards in nothern Illinois. It has been found at two or three points in Ogle county. I do not know that it has ever been found in Winnebago county, however its pernicious nature requires that we be able to recognize it, and that we carefully examine young trees before planting, as well as our growing trees. The scales somewhat resemble the scales of the scurfy bark louse, but are more nearly round and darker colored. Under a magnifying lens, they appear roughened and to be made up of concentric rings. If a tree is badly infested the bark will be rough and if scraped hard enough to crush the insects beneath the scales, a yellowish, greasy substance will be seen. The insects winter alive and in spring give birth to living young, which almost immediately form scales for themselves, that are impervious to the ordinary spraying solutions. Should the presence of the San José scale be suspected at any time in the orchard, specimens should at once be sent to the State Entomologist who will give you specific directions for treatment.

It is now to be noted, that the only pests for which we must regularly spray, are the apple scab fungus and the codlin moth. We should be able to recognize other orchard pests and be prepared to destroy them if they injure our tress, but in the main, spraying will be done for the two pests mentioned and at the same time.

Two borers, the round headed borer and the flat headed borer, have been troublesome in our orchard, especially to small trees. They work around the base of the trees and in the roots near the surface. Eggs from which these borers hatch, are deposited in crevices and on the surface of the bark early in the summer. If the trunks are washed occasionally with a strong lye solution the eggs will be destroyed. We also go over small trees once or twice during the summer, and, if burrows are found, dig out the grubs with a knife and piece of wire.

If we are going to spray successfully, we must have good machinery. There are a number of spray pump companies and a consideration of some of the essential points of a good pump will aid in selecting one with which to deal. All working parts should be made of brass. Copper sulphate and lime corrode iron and destroy leather and rubber. The best pumps are lined throughout with brass and are fitted with brass plungers and valves. A pump should have an air chamber to insure a steady stream, and some sort of a mechanical attachment for keeping the solution constantly mixed. A brass lined bamboo extension rod, eight or ten feet in length, should be provided, so that all parts of the tree may be easily reached. A shut-off cock at the hose end of this rod keeps the pressure from falling when going from tree to tree. The nozzle is an important part of the outfit. The object in spraying is to cover all parts of the tree with particles of the solution so finely devided that they will cling, and not fall off, as would drops. The double Vermorel nozzle is one of the very best nozzles that can be had. Such an outfit costs about fifteen dollars. Three neighbors are partners with us in an outfit, so the expense to each was not great. It is true each application requires the outlay of some money and involves some work, but if we appreciate an abundance of perfect apples, we cannot afford to allow our trees and fruit to go unsprayed.

Let us select and plant trees carefully, let us cultivate and spray them systematically and thoroughly, and we will never be heard to say, that the efforts to have an orchard is not paying and satisfactory.

THE FARMER'S FLOWER GARDEN.

[By A. C. Beal, Assistant in Horticulture, University of Illinois.]

The main planting of any home grounds should be trees and shrubs. To brighten the picture, which every home maker should try to produce by the arrangement of his materials, flowers should be grown. What kind of flowers to grow is a matter of personal taste and is not as important as where to grow them. An otherwise insignificant flower is attractive when seen against a background of foliage or buildings. Most of our flowers planted in beds, in the front lawns are not affective for this reason.

Further than this, it is too stingy a method of growing flowers. Nature grows flowers in a lavish way and one can pick them without spoiling the effect of the picture. The man who admires the formal geranium beds in the city parks does so because there is color enough to satisfy, while the half-dozen sickly yellow plants which he has planted in the yard do not make an impression. The man accustomed to doing large things is not impressed by a little flower bed covering an area no larger than a blanket. Have flowers in abundance, enough to furnish boquets every day until frost. The seeds are cheap enough, when you can get twenty paskages for a dollar.

Don't buy novelties, because, like fruit, their limits of adaption are unknown and a person gets less seed for the extra price than of the well known species or varieties. Mixed packets are most satisfactory, especially of such things as sweet peas, nasturtiums, petunias, asters, etc., as one gets the range of color possible, which is infinitely more satisfactory when you wish to make boquets.

Even if you are living upon a rented farm you can have flowers. Many of the best flowers are annuals. Send and get the catalogue of some well known seedsman and order your seeds immediately. If you wait until spring work begins you will not have time. Bachelor button *(Centaurea Cyanus)*, coreopsis; Clarkias, China asters, Californta poppies, candytuft, gilias, larkspurs, marigolds, nasturtims, pot marigolds, pinks *(Dianthus)*, phlox *(Drummondi)*, petunias, poppies, portulacca, sweet asylum, sweet peas, silene, stocks, verbena and zinnia are the general purpose annuals.

Prepare the flower border thoroughly and deeply, for annuals must make a quick growth. If the soil is not naturally rich, spade in well rotted manure or leaf mould from the woods. Do this very early in the season. If borders are made in sod, have them at least three feet wide, that the grass roots may not run underneath and rob the plants. Run a sharp spade around the bed from time to time early in the season to cut the grass roots.

Sow sweet peas just as early as you can work the ground in the spring. We generally have a warm spell about April 1, during which we should sow them. No matter if the ground freezes afterward, they will come out all right and be better than if sown later.

Such plants as cosmos and moonflowers, which require a long season, should be planted in a hot bed with your tomatoes and transplanted when danger of frost is past. Balsams, asters, plox, etc., can be hurried forward in this manner. Most flowers should be planted at the season for corn planting.

Having your bed or border in the typical "onion bed" condition, press the surface level with a board, sow the seeds thickly in drills or concentric circles depending on the location of your bed. If to be viewed from all sides place the tall kinds in the center, or if against a back-ground place the low ones in front. Make the edging of sweet asylum or portulacca (rose moss). Sow the seeds at a depth of about four times their thickness; cover them and press the surface smooth again with the board. This will promote capillarity by firming the soil. When the seedlings are up, thin to the proper distance apart. Keep the surface loose by frequent cultivation.

Some of the best screens can be made of annual plants. Among the best are flowering bean, wild cucumber, morning glory, cobæa, scandens, balloon vine and gourd. Such tall growing plants as sunflower, castor beans, nicotiana, etc., can be used for the same purpose. Sweet peas and nasturtiums are useful to hide a fence.

Many bulbous and tuberous plants can be grown by the renter. Gladiolus, dahlias, dwarfs cannas, tuberoses and madeira vine are among those most widely grown. These bulbs must be taken up in the fall and kept over winter in the cellar in a temperature favorable to potatoes and onions. Start cannas, tuberoses and dahlias early in spring in a warm room or hot bed.

The man who owns his own farm can have all these and more. He can use perennials in his flower-border. Suitable plants are pinks, paeonies, gaillardia, rudbeckia, candytuft, phlox, larkspur, bluebells and bleeding heart. He can bring in floral treasures from the fields and woods—plants native to his own locality. With a little care such plants can be removed and planted almost any day in the year when the ground can be spaded. Wild aster, golden rod, violets, ferns, columbine and other similar plants can be handled in this way. If one pays a little attention to the conditions under which the plant was growing when found and gives it as nearly as possible similar conditions in its new home, he will usually be successful.

For early spring bloom nothing is more satisfactory than a bed of tulips, narcissus, or hyacinths bordered with crocus or snowdrops. To make a buld bed throw out the top soil to a depth of six inches and place in the bottom two inches of well rotted manure. Spade this in and replace half of the top soil and level it. Set the bulbs firmly on this surface, hyacinths six inches, tulips fivo inches, narcissus three inches apart each way. Cover them with the balance of the top soil so that the bulbs are three or four inches below the surface. Crocus and snowdrops are planted touching each other. Tulips are best for making simple desighs in colors, but this is not necessary for pleasing effects.

When the ground begins to freeze apply a six-inch mulch of straw, marsh hay, cornstalks or coarse manure. If you use leaves put on only about three inches as they lie close together, thus smothering out the frost. Early in the spring this covering must be gradually removed or the heavy mulch may cause premature growth. After flowering the bulbs should be lifted and dried off as you would onions, kept in a dry place until fall and planted again. The bulb beds can be used for later-blooming annuals during the summer.

Among the best flowering shrubs are roses, snowballs, lilac, hydrangea paniculata, Japan quince, mock orange, spiræas, forsythia, privet, barberry, wild crab and reddub elder.

The folllowing list of roses proved hardy on the Wooded Island, Jackson park, Chicago, after eight years' trial:

Baroness Bothschild, Gen. Jacqueminot, Anne de Diesbach, Alfred Colomb, Louis Van Houtte, Marshall P. Wilder, Poenia, Prince Camille de Rohan, Victor Aerdier, Grace Darling, Madame Plantier, John Hopper, Mme Gabriel Luizet, Magna Charta, Mrs. John Laing, Paul Neyron, Souv. Gabriel de Levet, Mrs. Geo. Dickson, Francois Levet, Comptesse de Serenye, La France, Merveille de Lyon. Clothilde Soupert is another good rose and hardy during the coldest winters at Champaign. Crimson Rambler, Mary Washington, Baltimore Belle, Queen of the Prairies are the hardiest climbing roses. The hardy vines are honeysuckle, Virginia, clematis, wistaria, woodbine, matrimony vine, etc. All climbers are useful for covering verandas and relieving the monotony of rigid lines.

Sume people will want a flower garden in which is a collection of everything. This can either be a portion of the backyard or the vegetable garden. This is a matter of growing flowers for flowers' sake only. It is governed solely by the amount of time and land at one's disposal. In it grows the annuals and shrubs you like in the best way to show off each kind. Make winding paths with surprises at every turn. The flower garden is for the enjoyment of the family rather than the passer-by and thus affords the opportunity for experiment or the emphasizing of one's personal tastes.

SMALL FRUITS FOR THE NORTHERN HALF OF THE STATE AND HOW TO GROW THEM.

[By John W. Lloyd, Instructor in Horticulture, University of Illinois and Chief Assistant in Horticulture, Agricultural Experiment Station.]

If given proper care, strawberries, raspberries, blackberries, currants and gooseberries can be successfully grown almost anywhere in the northern part of this State. It is true that the strawberries are sometimes injured by late spring frosts, that the blackberries frequently dry upon the bushes, and that the currant worm usually shortens the life of the currant and gooseberry plantations.

The first difficulty can be largely avoided by planting upon high ground where the atmosphere drainage is good; the second by practicing a thoroughgoing system of cultivation, so that the soil moisture will be retained, and the third by the timely use of Paris green or hellebore.

Whether or not it will pay to grow small fruits for market in northern Illinois will depend upon the nature of the market, and the facilities of the grower for producing and handling the crop. In general, it may be said that the large markets are usually flooded with Michigan fruit at the time the northern Illinois fruit ripens. The markets of the smaller towns, however, are often insufficiently supplied. A local grower can sometimes virtually control his home market, even though fruit is shipped in from other points, because of the freshness and fragrance of his product.

Dismissing the matter of growing for market, since that phase of the subject is not of particular interest to a majority of the farmers of northern Illinois, and turning to the more personal matter of growing fruits for home consumption, it may be said that the farmer who spurns the berry patch, and says that he can buy fruit cheaper than he can raise it—and then does not buy it—is denying himself and his family of one of the so-called luxuries of life, which, however, may more properly be regarded as a necessity, if the highest development of physical, mental and moral health is to be attained.

The only sure way of having berries upon the farm is to raise them; and the only way to raise them successfully and satisfactorily is to supply the needs of the crop with as great care and precision as is practiced with the other crops on the farm. Thorough preparation of the soil before planting is of prime importance, and liberal fertilizing with stable manure will vastly increase the crop.

Cultivation is as necessary to the production of a good crop of small fruit as it is to the production of a good crop of corn. The style of cultivation to be used will depend upon the nature of the soil and the kind of fruit. Red raspberries and blackberries should be cultivated with an implement having square-edged teeth, which will cut off all the suckers instead of leaving them to sap the strength of the plant, causing the canes to be weak and the fruit crop light. The implement used for cultivating strawberries late in the season, after sufficient plants have been made, should be provided with a rolling cutter on either side, to cut off the runners and keep the space open between the rows. If strawberries are grown in matted rows, and no more than two crops are to be taken from a plantation, the chief attention to cultivation should be given the first year; and the cultivation that season should be very frequent and thorough, and continued late. The cultivation of the other small fruits should begin as soon as the ground can be worked each season, and should be frequent and thorough until after the fruit is harvested. If a cover crop is to be sown, cultivation should usually cease by the middle of August; otherwise, it may be continued until the close of the season.

In regions where blackberries are subject to winter killing, a cover crop will be found of immense value as a protection to the roots, and should be used unless the blackberries are to be laid down and protected—both roots and canes—by other covering. Strawberries must always be mulched with straw or other litter to prevent injury from repeated freezing and thawing. The same material will serve to keep the berries from being soiled by contact with the earth.

The bush fruits require careful attention to pruning, if the best results are to be secured. Proper pruning insures a stocky growth of the canes, so that they will hold up their fruit, thins the fruit so that the individual specimens will grow larger, and reduces the size of the top in proportion to the roots, thus insuring a vigorous growth of new wood.

The best pruning for blackberries, black raspberries, and the strong growing varieties of red raspberries (such as the Cuthbert) consists of four distinct operations: (1) Nipping off the tips of the growing shoots in summer when they have reached the height of one and a half or two feet, thus causing them to throw out strong laterals; (2) removing superflous shoots, so that only three to five remain in each hill; (3) cutting back the laterals to from 12 to 20 inches the next spring; (4) removing the old canes after they have produced their crop.

The annual pruning of currants and gooseberries may be all accomplished at one operation, which is usually performed early in the spring. It consists in removing such of the old canes as have passed their most useful period, and all of the one-year old canes except such as are needed to renew the bush where older canes are removed; and of thinning out and shortening back the new wood on the old canes that remain.

Currant worms, gooseberry mildew, strawberry leaf-roller, and strawberry blight are the enemies most likely to cause damage to the small fruit plantation. They can be controlled by the timely application of the proper spraying materials, and the practice of other sanitary precautions, such as the burning over of the strawberry bed after harvesting the crop.

POULTRY DEPARTMENT.

How and Why I Raise Poultry.

[By Mrs. M. Thompson, New Lenox, Ill.]

I think we may say that no other business connected with agricultural pursuits seems so attractive as poultry farming. To many, there is a delightful uncertainty, and a charming mystery that holds the interest and encourages one effort after another. Even those who fail in the business and give it up, are sure that they would succeed in a new trial.

At the start the general idea is that the business consists of throwing out corn to a flock of hens with one hand and gathering eggs with the other. While this may be true in a few cases, it is very different in others. The expert poultry raiser may perhaps meet with no difficulty and all may go on smoothly, but the novice is in trouble from the start. The eggs are few, and the chicks die no matter what high authority he consults, or what method he tries, he is met by failure in greater or less degree, and in despair he declares the whole thing to be an experiment anyway.

It is true that poultry raisers do experiment, just as progressive people in any business experiment, searching for better methods that will insure greater results. But poultry raising is certainly past what might be called the experimental stage. It is now recognized as a distinct occupation and the time is past when men who engage in it are looked upon as failures in life, who as a last resort try to make a living by raising poultry.

It is hard to form an idea of the amount of poultry raised and consumed by the people of the United States in a single year. Every farm yard has its flock of hens, and many people in villages and towns and even in cities keep a few chickens (much to the annoyance of their neighbors). The women on the farm, however, are by far the largest poultry raisers in the country, and often under very discouraging circumstances. That they do so well is much to their credit in ability and industry and that they do not have better conditions afforded them, is due, largely, to the under rating of the business by the men folks. I am convinced, and so is many another woman, that no other branch of farming returns such large profits on labor and money invested. But to convince the men! This is quite another thing. Nothing but figures will do it. Keep book account of your poultry for a year and I am sure that not only the "men folks," but you, yourself, will be surprised at the large balance in favor of hens.

Too much stress must not be laid on conveniences, however, for the best equipped poultry plant will not turn out eggs or fowls if the operator has not sufficient ability. A woman may do wonders with no accommodations at all, without even a henhouse. Two things she must have—fowls and food. If these are both good, she will soon increase her flock and improve her facilities. The success of women with poultry is due largely to their ingenuity. The training of this faculty began away back in the Garden of Eden, when Eve suggested making aprons of fig leaves. We find ingenuity just as essential in utilizing cracker boxes, old tin cans, and bits of boards in raising chickens, as we do in planning a dinner from an accumulation of left-overs, or in producing a new toilette from two or three old gowns. Ingenuity and cleverness are the names of our first steps toward success.

One may easily keep ten or a dozen fowls with a profit, who could not keep double or treble this number successfully, because with a large number all the difficulties which arise, such as want of cleanliness, the presence of vermin, impure air and risk of infection, increase in a much larger ratio than does the number in the flock.

But if one has succeeded with a small flock he may succeed with several flocks if each is kept in just the same manner as the first one. Afterwards flocks may be enlarged but as this is the very point where many fail, great caution should be observed in adding to the number of fowls kept in each coop, or house, or yard. After years of experience and observation, I find I can do best by limiting my flock to the number of 60. Of course through the year there are times when I have several times sixty, but I always sort out and sell off till I am within the limit again in the spring. I think a small flock, say 25 to 60, is more profitable than a large one, as ordinarily handled.

If a larger number are kept, many things need be considered. More houses are needed, more yards, and a great deal more time and care. Too many fowls should not be housed together even in a large house, nor should too many be fed together even in a large yard, as there are always some that get more than their share of food and thus get too fat for egg production, or good health, while those that are robbed are in a correspondingly poor condition. This inequality is much more noticeable in large flocks than in small ones.

Many pages have been written and many hours spent in discussing the question: "Which breed of fowls is most profitable?" These discussions usually give as a concluding answer, that all depends upon the location, market, personal preference, and so forth, and we still have a very hazy idea of the merits of one breed over those of any other. As for myself, I prefer the Plymouth Rocks though perhaps my preference has been largely governed by circumstances. Having this breed, I began raising broilers, and for this branch of the industry the Rocks cannot be beaten, acquiring size and feather, together with quality of flesh sooner than other breeds, and in many markets, notably in Chicago and Boston, have a decided preference on account of their yellow skin.

I have found that if properly managed, Plymouth Rocks are excellent winter layers, and I now combine the two lines of work, producing eggs for winter market and raising broilers in the spring.

I keep my flock as pure as possible, introducing new blood every year either by buying males or by buying a setting or two of eggs and raising the new stock myself. Keeping a flock well bred, pays, for blood tells just as much in the hen yard as in the dairy. Care tells, too. The saying: "There is no great excellence without great labor," applys to raising poultry in the same way it applies to any other business. So-called "Luck" is a misnomer. Factors that promote success in any occupation are equally as necessary in the poultry business. The very foundation of success is a strong, vigorous flock. To keep fowls in this condition, they must be well fed, well watered, well housed, and well exercised.

In winter, I feed, in the morning, a warm mash of small boiled potatoes, and ground corn and oats, with salt added, and occasionally a little pepper, especially if rainy or extremely cold. This mash is made not a bit sloppy, but dry enough to crumble readily, and is fed early on clean boards.

At noon I feed a little grain, mixed in chaff taken from the barn floor, besides what apple or potato parings are on hand, with any other scraps. At night I feed equal parts corn and oats, with wheat once in a while for a change. In addition to this bill of fare, I feed cut green bone two or three times a week, and provide skim milk when it is plentiful, besides water. My hens are constantly supplied with oyster shells and they are very fond of them. Most of the ashes are emptied where they can scratch them over and get what they like out of them.

My hen house is by no means a model structure, but is tight and has a good board floor, so is easily cleaned. I have plenty of nests and I change the straw in them often, for I have noticed that the hens delight in fresh nests, and flocks seem to be inspired to lay, sometimes, simply by providing good nests. It is my opinion that if hens that appear to be in good health do not lay, that the trouble lies with the quantity of food they get more than anything else. One says, "I am sure my fowls have plenty to eat, for they have full range of the place with free access to barns and corncrib." Now, no farmer feeds his horses, or his cows that way and there is no reason for feeding poultry that way, either. Poultry should be fed a balanced ration, regularly, and just enough, no more, no less. Fowls confined in yards, need very much more food than those that run at large. So for economy the range is preferable to confinement, and I think fowls at liberty are healthier too. But I have a yard where I may confine the flock if I choose. This yard is kept pure and wholesome by occasionally running over it with a one horse cultivator. If a pailfull of grain is first sown over the ground, the hens scratch for it, thus leveling the ground, and getting good exercise at the same time.

Hens that lay through winter will set early, and for several years I began setting them as soon as I could after the first of March, but found it impossible to have several broody hens at once so early, and was obliged to set two or three at a time, thus making much more work, and the chicks were of various ages and sizes.

I now have an incubator so I can begin hatching at any time and be ready for high prices. It requires great care, however, to secure such early hatches. Fowls must be kept in a healthy, vigorous condition that eggs may be fertile and have vitality enough to hatch. Eggs from fowls with frosted combs are likely to be weak. Eggs must be gathered several times a day so they will not be chilled, and they must not be kept in too cold nor too warm a place, nor kept too long before setting. In selecting eggs for incubation, I choose those of the best color, the largest and best shaped, for if a small egg is fertile, it produces a small chick, and a small chick can never catch up with a large, strong one, even if he does eat as much.

After two years experience with an incubator, I can say that I believe that to use one is less work and less expensive than hatching with hens. The care of the machine takes but five or six minutes a day and the amount of oil burned is small. I find the number of chicks hatched about equal in the two methods and the chicks about as vigorous hatched one way as the other. One decided argument in favor of the incubator is the saving of time to the hens. They may be kept laying much longer. But if they have laid well all winter and insist on resting in the spring, I sell them. In March and April, hens are scarce and bring the highest price, so it is a good time to sort over the flock and sell off old and least desirable stock.

To any who are thinking of using an incubator for the first time I would say, "Get a good one, then follow directions exactly." Remember the machine is an inanimate thing that has no brains. It can work only as it is operated with precision and regularity. Chickens, however they are hatched, should not be fed till 36 hours old, and should remain in the incubator, or with the hen, for that length of time. They will then be dry and strong and ready to be put into the brooder where the temperature should be about 85 degrees.

For the first day I feed hard boiled eggs chopped very fine. The second day, some of the chopped eggs with bread crumbs and a little fine meal dampened with sweet milk. Skim milk is excellent for moistening food for chickens of any age, but wet food must be crumbly, never a bit sloppy. This is important. If milk is not used I think best to scald the food, cooling it, of course, before feeding. I prepare an excellent food by scalding thick, sour milk till a curd is formed. This curd may be crumbled and fed by itself, or mixed with other food. Mashed potatoes, boiled beef chopped very fine, a little onion, millet, oatmeal, wheat bran, in fact anything chickens can eat is good food for chicks and the greater the variety, the faster they grow. Of course the variety of food must be gradually worked up too, but if well managed a brood of chicks two weeks old should be able to eat anything that is ground or chopped fine enough for them. I feed often, that is every hour, at first, but a small quantity at a time. The time between feeds is gradually lengthened, but chicks that are to be pushed and sold as broilers should never be fed less than four times a day. They should be fed in the morning as soon as it is light enough for them to see, and put to bed again for another nap, after which they should have a second breakfast and exercise. At night I give two suppers, the last one just before it is too dark to see. This may sound as if large quantities of food are used, but it is not so. "Little and often" is the rule, the aim being to make the time between the nest and the table as short as possible.

It is very necessary for chicks kept in a brooder to have sand and fine gravel to pick. They are also fond of egg shells, dried and rolled fine. Brooder chicks must also have ground green bone, or if one hasn't a bone cutter, scraps of beef or liver chopped fine will answer just as well. This besides supplying the necessary animal food gives them a motive for exercise, and a right merry time they have racing and chasing, the lucky fellows who have secured a scrap of the meat. After such vigorous exercise the babies need a nap and a rest. Indeed the naps and periods of exercise should alternate all through the day, for we observe how comfortably old Biddy hovers her brood after a walk.

I do not try to water chicks till the second day they are in the brooder. After that, several times a day. A good drinking fountain may be made by punching five or six holes in a tomato can about half an inch from the top. Fill the can with water, covering with a saucer turned upside down, and then quickly invert the whole thing. The water oozes out gradually and lasts a long time, and the chickens cannot get into the water, nor tip it over. But if any of the little fellows do get wet, they must be put to bed at once to get warm and dry, and thus avoid the danger of a chill.

The most common an fatal disease among chicks is diarrhoea, which is caused either by food that is wet or by catching cold. As soon as I notice a case, I remove the patient from the brood and give him a crumb of bread soaked in a drop of essence of ginger or Jamaica ginger, and keep him extra warm and feed dry feed until cured. I seldom loose a case treated in this way.

I may say here that during the past year I have not lost a single chick or fowl through sickness. This is perhaps a remarkable experience but I attribute it to the care I have given to the details of the business, especially the feeding.

When the weather permits, I let the chickens at two weeks old out of the brooder onto the ground, selecting a dry, sunny, sheltered place. Some broods seem to be afraid at first of the great endless space about them, while others become interested at once, and begin a tour of discovery. When I begin to feed out doors, I use feeding pen of slatted chicken fence. The chickens run in and out at pleasure, but the old fowls cannot get in to eat the food of the little ones. This pen is portable and can be moved from place to place as desired, and at the end of the season may be rolled up and stored away.

From ten to twelve weeks is the time usually required to raise broilers weighing two pounds or thereabouts. And though many sell chickens weighing a pound, or a pound and a half, I think it is not economy to sell them at much below two pounds I think I made more by selling at that size than any other, more even than full grown cockerels at $1 each. For one thing the price per pound is going lower about as fast as the chicken grows larger, so that after keeping stock several weeks, one may be obliged to take the same price, or less, per fowl than he might have had for smaller stock at an earlier date, and thus lose on feed and care given.

By selling early, I feel that I lessen the risk of losing stock especially by minks, weasels and so forth, for it is usually after midsummer that such vermin begin their depredations. When one has small accommodations, it is an advantage to dispose of early stock to make room for later broods that are outgrowing their quarters. I try to have all hatches out by the first of June. Late chickens mature too rapidly, without getting the size earlier ones do. I sell the earliest spring chickens I raise to meat markets here in Joliet, but the most of my stock is sold to individual customers and they like the market men, are always willing to pay for a good fowl. I deliver poultry either alive or dressed and at the same time have opportunity to sell, at retail prices, all the fresh eggs I can spare.

Now, I have told you, in a general way, how I raise poultry, and though I am aware that most of my methods are used by many people who fail, I should like to say that I am sure success is not the result of the method, but of persistent effort and systematic management.

The reason "why" I raise poultry are few and may be quickly given. The first is that we have plenty of fresh eggs and fowls for our own table. This is a luxury in which every farmer's family may indulge if they will take the time to raise and care for a flock of hens.

This is one of the privileges we enjoy by living in the country, and I count it a duty, too, to provide these nutritious articles of food for our families. It is economy also, for if we raise all we can of these things, we shall not need to buy them, or other things to take their places.

The second reason is that I find my health benefitted by the out door exercise. Fresh air and refreshing views of nature are also luxuries in which farmer's wives may indulge, but how few do so. A three minute walk or run out in the sunshine cheers and rests one remarkably and one may as well do something, feed the chickens, for instance, while taking the three minutes.

The third reason why I raise poultry is that I enjoy the financial returns I receive for my work. To be sure this income is comparatively small but so also is the labor expended. I consider the money I receive for eggs and fowls sold, as profits of the business, for the large amount of eggs and chickens used on our own table pays for the keep of the entire flock.

I may give as a fourth reason, that I raise poultry because I like to do so, and this. perhaps, is the greatest reason of them all, for I think if I disliked the work I should very likely consider my housekeeping and family cares all I could undertake, but I enjoy the chicken business, and make it a recreation and pastime in much the same way that in years past I took care of flowers and plants or did crochet work or embroidery. And perhaps this is the secret of success, for with poultry as with anything else, one is not likely to attain very decided success unless be likes the work wherein he succeeds.

SHEEP DEPARTMENT.

[By E. D. Funk. Shirley, Ill.]

Mr. President, Ladies and Gentlemen: It is with very much regret that I should have accepted an invitation from your committee, last summer, to prepare a paper for your annual institute meeting and not be able to be with you, in person, to deliver it.

Circumstances have caused it to be otherwise, but rather than disappoint my friends at home entirely, I shall endeavor to write a few lines that may be read. The sum and substance of which may be taken for just what they are worth.

I further regret that I cannot be with, and picture to you, in a few words the advantages of these never failing fertile valleys and of such beautiful scenery from the snow-capped mountains in this far western country of ours. When roses are blooming and the grass still green and where my little girl picked a wild strawberry blossom in the woods the day before Christmas; of my visits to the different sheep and cattle ranches here, and to the Oregon College of Agriculture, at Corvallis, where there are over 400 farmers' sons and daughters studying agriculture; and to tell you of the enormous wheat, oats and hay crops that grow here. Fruit, no end of it, but corn—oh, my! It makes an Oregonian wonder when you talk about corn.

When a small boy, a few years ago, it was my duty to attend to the chickens and hunt the eggs in and about the barns, hog pens and lots, then for the greater part of the night I would be fighting fleas.

An old uncle, who was visiting at our house, advised me to get some sheep; that the fleas would get into the wool and could not escape. I tried the experiment. I commenced with a flock of thirteen ewes. Have kept the increase of ewe lambs and invested the net proceeds of sales of wether lambs, old ewes and wool, until we now have in the neighborhood of seven hundred sheep and no fleas.

Every farmer should be the owner of at least a few sheep. He will scarcely miss the amount of food required to carry them through certain periods of the year, but he and everyone else will notice and appreciate the "cleaning-process" at which they are continually busy; in the fence corners, along the hedge rows and around the lots, especially if there is undergrowth of brush, sprouts and weeds.

A few years ago, I purchased a small farm adjoining my father's land, which was, to say the least, one of the worst run-down places in the country. Obnoxious weeds of all sorts, the burdock higher than my head. To make a long story short, I turned the whole flock of sheep in, and in a few weeks they had the burdock eaten right into the ground.

The sheep, while it is one of the daintiest of animals, will live and grow fat where a cow would starve to death. Every fall we aim to cull out and ship off all old and weak ewes; also fatten and ship the wether lambs during the fall and winter. We make it a point to buy the best registered rams we can find. There is nothing gained in using a "cheap jersey" even on a flock of grade ewes.

This last spring, using the money obtained from the sale of wool, we took advantage of a very favorable opportunity to import direct from England a few of the best specimens, both male and female, from two of the leading flocks in that country. Thus you will see we are striving to obtain the best that there is.

It takes no more care and no more feed to raise a good sheep than a scrub, if one must expect success from either. Experience has thoroughly taught me, that by all means stick to one recognized breed in raising sheep, as well as any other kind of stock—even in grains; that is, if one wishes to continue in the business and select his breeding ewes from his flock from year to year.

First, select your breed, obtain the best ewes you can find for the money to begin with, and continue by introducing new blood of the same breed. If your ewes happen to be a little coarse and too open wool, try to find a denser fleeced and small-boned buck of the same breed, rather than cross with a fine wool of some other breed and throw your flock into a half blood or quarter blood, and then into something else, and then on for years until you have nothing but a mongrel, no distinct type, and without doubt a weak constitution. You can number on your own fingers many flocks and herds which have been crossed and re-crossed until today they show very little breeding and scarcely any constitution, more inclined to lie down and die than try to live.

If one wants to raise early lambs, that is winter lambs, he must be thoroughly prepared and clearly understand his business; I don't advise every one to try it. It means sleepless nights, nursing bottles and warming blankets. They usually bring a good price, to be sure, but it is a question whether the extra dollar pays for the extra care and attention.

We aim to have our early lambs come in January or the first of February, the earlier the better. The ewes are kept in good thrifty condition and fed a little sheaf oats and clover hay. They are made to take plenty of exercise and are not housed until about lambing time, except in extremely stormy weather. We then watch our ewes very closely and are obliged to be with them continually, both day and night. Of course they are now in a good warm barn. We fence off little pens about six feet square and put a ewe and her lambs in by themselves for two or three days, until the lambs will have become strong enough and sufficiently acquainted with their mother to know and find her, when turned in with a number of ewes and lambs in a larger place provided in the barn.

We now feed the ewes a little corn and oats and all the clover hay they want, or shredded corn fodder, which makes an excellent roughness for sheep. In a convenient corner is a small trough filled with coarsely ground corn meal, oats and a little oil cake to which the lambs can run. You will be surprised how quickly they will find that corner and visit it many times a day. On bright, sunny days they have access to a dry lot on the south side of the barn. Of course plenty of good pure water is by them all the time. By the middle of March or the first of April the earliest lambs should weigh 40 pounds and be ready for market. And if we could have a contract with some of the leading clubs of New York or Chicago and get 25 cents a pound for them, as I know of a few favored ones doing, there would be good profit in raising early lambs. Allow me to say here that in Oregon they raise eight-weeks'-old lambs weighing 60 pounds, but their market is not even so good as ours.

Almost anyone can raise spring lambs. We aim to have our spring lambs come from the middle of April to the middle of May out of doors, and give them very little attention unless the spring is extremely late and the weather very bad.

We do not house any of our sheep at any time of the year unless the weather is very bad and the snow very deep, or when we are feeding for the market. We have good hedge wind-breaks and groves, and dry open sheds facing the south is not a bad idea.

We insist on our breeding ewes taking plenty of exercise, allowing them to run in the fields after the corn has been gathered, and do not feed them any grain unless the snow and sleet covers up the stalks. Then they have a small allowance of sheaf oats and clover hay, and if very cold, a little corn. When springtime comes, they go out onto blue grass pasture. Here I would advise, in the absence of plenty of blue grass, sowing some rye in the fall to be used for early spring pasture. In the pasture they have their young unmolested. I say unmolested, though of course a careful shepherd will always need to visit his flock and keep a close watch during the lambing time to see that everything is all right; that some poor little twin lamb does not get lost from its mother long enough so that she will not own it later in the day; nothing is more aggravating than to have a ewe disown her lamb.

Now when lambs are two weeks old we mark them and trim them. Cut their tails with a sharp knife, as close as possible, putting a little raw linseed oil mixed with a few drops of carbolic acid onto the wound. The acid will keep the fles away. If, perchance, flies should get into your lambs, use a little gasoline to kill the maggots. It is not so severe as turpentine; afterwards paint well with pine-tar.

If I want my lambs to "grow big" I would commence to feed them some threshed oats. I would fence off one or two fence corners, where the lambs could creep through and the old ewes could not, and in low troughs, with a board running lengthwise, high enough so the lambs could not get into the trough with their feet, would put a little threshed oats, a very little at first, and keep increasing it as the lambs grow older and can eat more. If I wanted to get them ready for market as soon as possible, would add corn to the oats.

Of course, we can turn lambs, rams and ewes all out in the woods and let them take care of themselves, and you will have (if the dogs don't catch them) some sheep left, but you won't raise any 100 per cent of lambs nor top the market when you get ready to sll.

Shearing time comes and you undertake the task yourself. Don't do it—give some fellow who knows how and who can save a pound of wool more to the fleece, than you can, eight cents per head to shear and tie the wool up for you. Caution him particularly to throw out all dirty tags. (I should have mentioned before, a good and wise plan is to tag the ewes quite early in the spring, before the young grass starts; one can, by this way, save another half pound of wool.) You can not cheat a wool buyer more than once by selling him dirt.

Relate experience of how we sell our wool. A couple of weeks after shearing, if it is possible, the sheep should be dipped, but if one has only a small flock and not all the arrangements for dipping the older sheep, he can dip the lambs in a barrel. If there are any ticks or lice, this will remove them. Almost any of the sheep dips on the market will answer.

The hot sun of summer comes and our sheep need the shade of some tree or temporary shed. I think sheep suffer more from lack of shade than from exposure to the cold. Nature has provided them with a blanket but not with an umbrella.

About three weeks after we have harvested our oats, we are ready to turn our sheep onto our rape and clover fields, the same piece of ground from which our oats were cut. Rape, oats and clover all having been sown at the same time in the early spring.

We do not turn them into the rape fields and leave them at first, but work them up to it gradually, say four or five days. Nor do we allow them to go in the fields for the first time while the dew is on the ground. But after the sheep have become accustomed to eating and sort of get "filled up," as it were, then we have never had any serious results from allowing them the free run of the field, both day and night. If one does not stock his rape fields too heavily, they will produce a wonderful amount of feed until the heavy frosts come.

Sometimes we wean our lambs and put them in the corn fields, sown with rye, about the time corn is in roasting ears. They will not destroy the corn if it is not blown down and they will do well. But one can not turn old sheep into a corn field.

In conclusion I would say, try a small flock of sheep on your farm. Encourage the boys and let them have a few sheep. When they have learned by experience, add more, or by keeping the ewe lambs you can soon grow a flock of any size you wish.

When you get started, stay by it, and don't sell out when sheep are down to the lowest notch and start in again when sheep are high, or when you have had hard luck and lose part of your lambs from the dreaded stomach worm. But stay by it, and I am satisfied that you will find as a part of your business it is more profitable than most of the other departments of the farm.

SWINE DEPARTMENT.

THE BEST METHOD OF GROWING HOGS ON THE FARM.

By A. J. Lovejoy, Roscoe, Ill.

The hog is well known over the entire world and is confined to no one part in particular. He is the animal which the ancients sacrificed to the goddess of the harvest, Ceres. He is also, as the Irishman says, the "Gintleman that pays the rint." The utility of the hog lies in a great measure to its remarkable fecundity, reproducing at one year old or less, and bearing from five to ten, and often more. Some man of figures has estimated the product of a single sow with only six at a time, in ten generations to amount to the grand total of 6,500,000. This number would no doubt stagger the statistics of the American hen, as given by our ardent advocates of her producing qualities, and it takes a great statistician to get ahead of a "hen crank."

MONEY IN HOGS.

The hog has been a reliable source of revenue on the American farm since the earliest recollection of man, when the farmer kept but three to six to use up the refuse of the kitchen and dairy and supply the family with good old fashioned home made sausage and juicy ham. This reminds me of a certain "down east" farm paper that only a few months ago stated that "every farmer should keep a pig." The up-to-date hog of today supplies in his various products the wants of the people of the entire civilized world, not only with choice bacon and hams, but with various articles of use manufactured from the by products of his hogship. There is nothing wasted but the squeal. Hardly a day passes that we do not hear the remark, "as dirty as a pig." This I consider a villification of the animal, which Franklin's colored servant said was "the only gentleman in England," from the fact that he was the only animal that did not work in that country. In this respect he much resembles the members of the legislature. He calls to order and adjourns to eat and sleep. I believe the hog is the most cleanly of our domestic animals if raised as he should be, and given a chance to roam about and not confined to very close quarters. To get the most money out of the hog business one must look to the cheapest way to feed him and get him to a proper shipping weight as early as possible. To do this one must have good pasture of some kind. If clover, which is without doubt the best, can not be had, it would be well to sow some variety of grain or grass very early so that the pigs and their mothers could run on this pasture. Early sown oats, rye, barley, or rape, field peas, or any of the various things that may be grown for this purpose. I have heard it said that if you would sow a variety of grains for pig pasture side by side, that the pigs would eat the barley to the ground before they would touch the others. I do not know whether this is a fact or not. I do know that the suckling sow and her litter will thrive much better to have some kind of good pasture. A hog will not eat much grass, but the little he does eat does him a world of good. It should not of course be the only feed, but should be fed in conjunction with other good feed, and if fed as most of our farmers feed, with corn exclusively, it will be worth much more to the sow and litter than if they could have a variety of the proper feed. It is a well known fact that corn, and corn only, will produce nothing but the white meat or pure fat, and a pig taken at weaning time and kept in a dry yard and fed nothing but corn and water, would never develop anything but a chunk of blubber not fit to eat, and at a cost much greater than if fed on pasture and a variety of grains or other feed. This is one of the reasons why the hogs grown and fed in what is called the corn belt of the U. S. have become so small and weak compared with what they were years ago. Too many feed nothing but corn and in dry yards without any grass or green feed.

THE BEST HOG TO RAISE.

What kind of hog is most in demand? What shall we as farmers breed to receive the most profit from in the shortest possible time? There has been for the last few years a great hue and cry about the "bacon hog," and there are many who think we should return to the type of forty years ago, thus losing all the improvement made in the feeding qualities of the improved modern breeds of today. It is a fact nevertheless that the markets are paying more today for the "fat backs" than for a bacon type, or for any other class of hogs. To show you that even in London, England, and Limerick, Ireland, what is thought of American bacon and hams, I will quote from a former article that is probably familiar to you all.

"The principal reason that our pork products are discriminated against abroad is because it is of a better quality and sells for less than their own home production." It is a well known fact that the highest priced fancy pork products sold in Ireland by the Limerick dealers were put up in our own Chicago, and by special instructions marked with private brands of Limerick dealers, who for years past have been selling Illinois hams and pork products on the Continent as best Irish bacon and hams. "The authority for this you can find in the consular reports numbers 122 and 129. In further proof, I will cite you to a case of the Bacon Curers' Association of Great Britain, who prosecuted the Junior Army and Navy stores of London for selling American hams for Irish and secured a fine and costs amounting to $360. Investigation showed that the American hams were changed into Wiltshire hams by oiling and rubbing meal over them and branding them 'Finest Wiltshire.' They were then put on the market as Irish product and sold for 24 cents per pound, while the remainder of the same consignment sold for 17 cents as American hams. A Leeds correspondent for an eastern paper states that in their market the best American hams need no faking to bring the high prices they now bring." Only last week while talking to a party regarding the brand of bacon and hams used on one of the great sailing vessels, its quality was so high that a discussion arose as to whether it was a foreign product or American, when it was agreed to leave the matter to the steward of the boat, and he admitted that they were American product. All the American farmer needs to do is to keep up the quality of his product, and the English market will ever be his. It would thus seem that we need no change of breeds to produce the finest quality of export hams and bacon.

If we want to make any improvement in the quality of our hogs for the production of bacon it can be done by selecting the larger or more rangy sows for breeders, then by a system of feeding the by-products of the dairy and mill with good pasture and less corn, we may practically accomplish the result, but until the packers of this country make a higher price for fed with a view to producing a higher quality of bacon, will it ever pay to very much change the early maturing type of hogs as now bred in the corn belt of this country.

ADVANTAGES OF THE EARLY MATURING TYPE.

I spoke of there being more profit of the early maturing type of hogs than of the so-called bacon sorts. By early maturing type I mean the improved hog of today of whatever breed the farmer prefers or fancies, whether it be a Poland China, Chester White, Duroc Jersey or a Berkshire. I am not here to advocate any breed, as each man has his preference, and when "Ephraim is joined to his idols," I say let him alone. All I would ask is that whatever the breed you like try and use the best sires to be had of that breed, but do not use a scrub because he seems cheap; he will prove the most expensive investment you can make. The farmers of this country owe much to the men that are breeding pure breed hogs, and yet we are all called cranks, and many is the time that I have been ridiculed for paying a price for a sire that we have done, and have stood the jeers and slurs that were made by parties that thought that anything in the hog line that had a snout and wore bristles was good enough, so it could eat corn out of a mud hole and pass off for a hog.

A hog that is well bred of any of the above breeds can be ready for market at any time from the day he is weaned—if properly fed and let remain with his dam—till three months old, or till the owner wants to sell him. He can very easily make from a pound to a pound and one-quarter per day from birth, and often much more if pushed with the best of feeds. Remember, it costs but about one-fourth for the food of support for the first 100 pounds as for the fourth 100 pounds. The risk is also much less in breeding and feeding, so that your pigs may be turned off at six to eight months old, than in carrying them along till they weigh 300 to 400 pounds each. Better plan to raise two crops each year from your sows. It is, I believe, as profitable to raise fall pigs as those from spring litters, if one will have a warm place for them to sleep and not keep too many in a pen together, and certainly so if he will feed them warm feed. I know many of you will say this is too much trouble, and that it does not pay to cook feed, but I am here to say, that whether the experiment stations can show that it does not pay to cook feed or not, I know to a certainty that it pays to feed warm feed. I can not say that thorough cooking pays, but to feed 50 to 100 young pigs just weaned when the mercury is hovering around zero or lower, anything other than warm feed will prove a loosing business. I do not say that I would cook or warm feed for a bunch of fattening hogs of 200 to 300 pounds, but would certainly do so for young pigs of three to four months of age or less, and also to the sows that are suckling pigs. We have at home some 75 pigs farrowed during October, and a few from September litters, that have made a pound of gain per day from birth, and some that have made more than this. However, each litter has been kept by itself, and had a warm place to sleep, and have had two feeds daily of warm feed. I was in the Chicago yards a few days ago and could not but notice the large numbers of young pigs coming to market in a half-starved condition. It would seem to me even at the high prices of feed, that it would pay, and pay well, to keep these young pigs at home and even buy feed for them, and not send them to market till they are in shape to bring nearly the top price. There can not be any profit in any kind of half-fed or half-conditioned stock. If our farmers would go to the market with their stock and watch the thousands of car loads of stock coming to market and note the kinds and qualities that sell quickly at the top prices, and again the kind that sell after all others are sold, and bring nothing but loss, it would seem that it would spur them on to try and raise something that would pay for their time and care.

I was talking with a farmer at Beloit the other day, and he was complaining that he had some cattle that he was fattening, and that they are worth nothing. I said to him, what can you get for your fat cattle, and he replied about 3 cents. I said they must be very poor cattle, as good cattle were never higher, hardly than now, and mentioned a case where a man had just sold a load of two-year old cattle in Chicago for 7 cents per pound. I merely mention this to show the necessity of growing and feeding a better grade of stock, whether it be in cattle, sheep or swine. The best profit comes from the best quality and best fed. The proper time to mate your sows for the spring litter, I think would be in December; this will give you April litters, and the weather is such then that the saving of the pigs, and the danger from the little fellows laying in the nest and getting what is called the "thumps" is all past. This so-called "thumps" is nothing more or less than indigestion, caused from lack of exercise, and usually is confined to the very early litter that comes when the weather is so cold that the pigs will not come out of their nest, but remain there day after day, and to all appearance are the finest pigs you ever raised, until you notice that they begin to breath short and quick and if moved about at all will almost strangle for breath. When they reach this condition their life is of but a few days at most. The only thing that will save an early litter of pigs is to get after them and make them go out, and chase them around. I have, when not too far gone, taken them several rods from the mother and they would wobble back, and by continuing this might possibly save them. I would many times rather lose a fall litter than a very early spring litter.

ATTENTION TO DETAILS.

There are many things connected with the successful growing of swine besides breeding a good grade of hogs and being a good feeder. These are, of course, the two main things to be considered, but to get the best results one should be a careful and close observer. He should note daily each animal and see if each comes to his feed and eats with a relish, watch the condition of the bowels and examine the coat of hair and see that there is no vermin. This is no doubt one of the greatest troubles to contend with. If you once get your herd infested with lice you will find that it will require eternal vigilence to entirely get rid of the pest. One of the best things to quickly rid the herd of vermin is to sprinkle them with crude petroleum; another is a kerosene emulsion made as follows: Take one-half pound of soap and boil it in two quarts of water. When the soap is dissolved add to this mixture while hot one pint of kerosene oil. Stir well and it will make a permanent mixture that will resemble milk. To this add ten parts of water and spray the animals with it. If it could be done it would be much better to dip them as it would then get over all parts. There is a preparation that we use in our own herd called "Moore's hog dip," which we use by running the hog through the dipping tank same as we do sheep. We like this method better than any, and during the warm months we dip our entire herd every week or two, and the benefit to the coat and skin and general thrift is very noticeable. We have also found this article the best cure for worms, by feeding a pint to a barrel of slop. This preparation in its crude form looks like a thick molasses, but when diluted with 50 parts water looks like milk. Pigs or hogs that are being pushed to make all the gain possible should have some charcoal as often as once a week. This can be made by burning the cobs and smothering out the fire before they all burn to ashes. In our business we use a regular pit made on purpose. We dug a hole six feet deep and shaped like a cistern, about five feet in diameter and walled it up with stone to keep it from caving in. We start a fire in the bottom and throw on a few cobs and after it gets well going we fill it up to the top with cobs and cover it over so that it can have but little draught, and when burned to a glow we put on the sheet iron cover made for this purpose and bank a little dirt about the edges to stop all air or draught and let the fire smother out. When cool we feed this about once a week and the hogs will leave any feed on the farm to eat it. Keep the premises well disinfected with either slaked lime or by using any of the good disinfectants now on the market. You may say all these things are too much trouble, but remember that anything that pays is a source of trouble and work. Many of you will allow yourselves to be tied to a cow's tail 365 days in a year, never having time to go anywhere or take any comfort, and yet it does not begin to pay with the raising of swine if given anywhere near the same attention. How much time do you suppose you give to the swine part of your business anyway? Probably not a full hour of the day, and yet they pay you well. You may say it is risky and you are liable to have disease in the herd. This is all very true; what would hogs be worth if there were no disease? Why, it would be a life of luxury to grow them—but they would not be worth 2 cents per pound. Of course the growing of hogs is not a path strewn with flowers; neither is any other business, yet if you are willing to take good care of your hogs and not give one a kick whenever you get near enough, you will find it one year with another one of the quickest and surest methods of converting the products of the farm into cash. It is the finished product from the farm that pays best. Our farms should be a manufacturing plant to sell everything produced in the condensed form. In these days of close margins no man can for a series of years make money by selling the raw material and reducing the fertility of his farm. In summing up, I would advise the breeding of more hogs. Use good sires of any breed you like, feed well, select carefully, use your best judgment in feeding and care taking, and in ten years you will say it paid you well.

MISCELLANEOUS DEPARTMENT.

NOTE—The following report on "Soil Survey of Tazewell Co." is given because it is the first published report of the work in Illinois and should interest farmers all over the State in the work the general government is doing in this line in connection with the soil investigations and experiments provided for by the appropriation of bill 315.—Secretary.

THE SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS.

[By Dr. J. A. Bousteel, Washington, D. C.]

During the months of April and May, 1902, soil investigations covering Tazewell county were carried on by the Bureau of Soils, Washington, D. C., in coöperation with the University of Illinois. It is the purpose of these investigations to ascertain the variety and extent of the soils of the county, to study their chemical and physical properties and to represent the facts thus determined by a colored map showing the location, area and boundaries of each different soil and to present the results obtained both in the field and in the laboratories in the form of a report accompanying the map.

The map and report on Tazewell county will be published and ready for free distribution by the United States Department of Agriculture by September, 1903.

Work of this character has been in progress in the United States since 1899 and various state organizations have coöperated in the work with the Bureau of Soils. Tazewell county is the first area to be taken up in the State of Illinois and this account of the work is presented in order that those who are interested may be made familiar with the object and inception of the investigations.

The four factors chiefly influencing the prosperity of any agricultural community are climate, soil, market and labor. In the present state of development of American industry it may be safely stated that given the conditions of climate and soil favorable to the production of any staple crop or crops the capital and industry of the people may be depended upon for furnishing proper facilities of labor and transportation. Thus the study of crop production is narrowed to an investigation of the climate and soil conditions most favorable to given crops.

The study of the soils of the United States though yet young has developed the following facts: First, certain crops can be produced most economically on certain soils. Second, there have been found in all localities so far studied a greater variety of soils than was anticipated. Third, the comparison of soils of various areas with each other and, particularly, the comparison of the methods of cultivation in vogue have led to improvements in the agricultural conditions wherever the studies have been made.

The first phase, that of adoption of crop to soil, is one which every farmer practices to some extent on his own ground. The extensive development of grain production in some sections is not accidental. Climate and soil conditions of the great Red river valley of Dakota have led to the production of large amounts of a special uniform grade of wheat; the presence of a suitable soil along the Atlantic coast has fostered the trucking industry which now extends from Florida to Long Island.

The adaptation of soil to crop gives rise to the wrapper leaf tobacco industry of the Connecticut valley; while the soils of the broad prairie belt of the central states have given pre-eminence to the production of corn.

Although the country is already characterized by a partial adaptation of crop to soil, a more careful study of the soil conditions of various communities is leading to a more detailed specialization and a more economical system of agriculture.

The investigations of the past few years, carried on by the department of agriculture and by state organizations have led to a desire for a more thorough knowledge of the operations of each factor controlling crop growth.

The bureau of soils is engaged in preparing maps which will form the basis for further study both along the line of laboratory research and of field experiments. It has already been ascertained that the amount of moisture which a given soil can maintain during the growing season together with the freedom with which that moisture can circulate, charged with plant foods, about the roots of the growing plants largely determines the productiveness of the crop. Not only does the plant require the soil solutions for its nourishment, but it also demands a large amount of water which may circulate through its tissues and be transpired from its pores. Only in this way can the plant continue its growth during the heated period of summer.

It is evident that different plants require different amounts of moisture and nourishment at various stages of their growth. Thus the truck crops which derive their greatest value from being forced on at an early market, must be forced to early fruitage even though the normal processes of vegetation are stopped. So a loose sandy soil which becomes dried out early in the season aids in checking growth and in forcing the maturity of fruit. On the other hand grains like corn require a long steady growth and a maximum supply of soil moisture during the droughty periods of July and August. This can only be secured if the soil is such as to form a perfect reservoir for storing moisture from the spring rains. Many other instances of adaptation might be cited.

The size and arrangement of the mineral particles constituting a soil, and the proportion and condition of the organic matter present in it largely control the ability of a soil to contain moisture. Thus a loose, porous, sandy soil almost devoid of organic matter can only maintain within itself a low percentage of moisture, actually about 5 per cent. This amount is sufficient for maturing sweet potatoes or watermelons, but totally inadequate to mature a crop of wheat or corn. A stiff clay soil maintains 20 to 25 per cent of moisture, and is thus suited to produce a long-lived grain crop, while it would not mature a truck crop until the market had been glutted by produce from earlier soils.

The field parties classify the soils of an area upon which they are working according to the texture, structure, topography and drainage. In each case the crop adaptability of the soil determines its classification. As soon as the different types in an area are ascertained the boundaries are traced and the location and extent of the type are marked in color on a field map. Then statistics of actual crop, production and of the cultivation of the soils are secured, and finally when the type is well established representative samples are secured for laboratory examination and special problems are reported for further investigation. In some instances the field work has been followed immediately by experiments conducted in the area to develop the special adaptation of a given crop to a given soil. The introduction of the culture of Sumatra tobacco in the Connecticut area may be cited as an example. In Illinois the coöperation of the State authorities will be in part along this line of research.

In Tazewell county a great variety of soils was encountered. Some of these have been studied and mapped elsewhere, though the majority have not been found in any area studied before. The adaptation of these soils to various crops will be considered in the report. The soils of the area will be compared with others and their physical and chemical properties discussed.

The soil survey is being extended over the State, and Clinton, St. Clair and Clay counties will also be surveyed during the season of 1902.

CIRCULAR NO. 39.

UNIVERSITY OF ILLINOIS,
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URBANA, ILL., February, 1902.

DIRECTIONS AND FORMULAS FOR SPRAYING.

The important details of spraying are fully discussed in Bulletin 68 of this station. The fruit-grower should thoroughly familiarize himself with those details before attempting to follow the directions given below:

For successful spraying, five points must be kept in view: 1, pure materials; 2, proper preparation of mixtures; 3, proper method of application; 4, time of application; 5, good judgment.

PURE MATERIALS.

Without pure and reliable materials successful spraying is impossible. This applies to all commercially prepared insecticides and fungicides, especially the arsenites, such as Paris green and Scheele's green. This means that success depends upon the chemical composition of the article and upon the proper percentage of some one poisonous active principle. Paris green has become the most important insecticide at present in use for destroying chewing insects. It is a comparatively cheap and effective poison when of proper strength and purity and if properly applied. During late years many serious complaints have been made against its variable composition. Until laws controlling the manufacture and sale of Paris green are enacted in this state the fruit-growers will have to rely upon the few simple tests they are able to make for themselves or upon the honesty and reliability of the manufacturers of the poison. There are a few tests which the grower can make for himself. These will enable him to detect gross adulteration. The verification of the full content of poisonous principles and their proper combination can be performed only by experts. The points which the grower can determine for himself are the following:

1. Paris green should be a dry and wholly impalpable powder. Grittiness and cakiness are evidences of adulteration.

2. It should have a bright, light, emerald green color. Dullness, and a light or faded color are indications of low grade.

3. To test the color, place a small quantity—what one can pick up on the point of a pen-knife—on a small piece of window glass which has been polished, clean and dry. Tilt the glass at a slight angle and tap its edge gently —enough to cause the green to run down, leaving a streak across the surface. The streak should remain bright emerald green; if whitish, the sample is inferior.

4. Place a small quantity in a small glass vessel. Pour on a quantity of common ammonia water. If the green is pure it will *all* disolve. If a residue is left, the sample has been adulterated.

Because of the widespread dissatisfaction resulting from impure Paris green, several substitutes have been suggested which can be home-made, and which therefore possess the advantage of being of known composition. The most promising of these are perhaps the arsenite of lime and the arsenite and arsenate of lead. These mixtures have been used with more or less success. The formulas and directions for making them are given below. A number of substitutes for Paris green are being manufactured and sold, usually under the trade names "aresnoids" or arsenates of different composition. Some of these have been successfully used but they are open to the same objectionable uncertainties as the commercially-prepared Paris green, and they must be dealt with accordingly.

The other materials used for spraying purposes in Illinois (copper sulphate, copper carbonate, white arsenic, sal soda, etc.) are pure enough for all practical purposes, as found in commerce, and need not be so rigidly tested as Paris green.

PROPER PREPARATION OF MIXTURES.

Much depends upon the manner in which the spray mixtures are prepared. As in all technical operations, there is a "right and a wrong" way of preparing compounds or solutions for spray work. Even so simple an operation as the common mixing of Paris green and water forms no exception to the rule. The difficulty increases as the mixture becomes more complex.

In the preparation of Paris green the powder must be thoroughly wet before it is added to the full quantity of water. The easiest way to do this is to put it into a jug along with a small quantity of water, close the vessel and then shake vigorously until the powder and water are thoroughly mixed. Then the wetted green may be added to the full quantity of water.

Little need be said upon the preparation of simple solutions. In most cases it consists in simply pouring the compound to be dissolved into the water or other solvent. As a general rule it may be stated that warming the solvent and powdering the solids hasten solution, and will therefore be advantageous when the solution has to be prepared on short notice. Stirring also hastens solution. In the case of copper sulphate the solution is heavier than water. If the salt is simply placed in the water, it will sink to the bottom and there a "saturated" solution will be formed around it, thus greatly retarding the solution of the whole mass of sulphate. The latter should, therefore, be put into a bag or basket and suspended at the top of the liquid. In this way the solution sinks to the bottom as soon as it is formed, and thus the sulphate is kept in contact with fresh water.

The preparation of the ammoniacal copper carbonate solution requires special manipulation, which will be specified with the directions given below.

Emulsions are mechanical mixtures of waxy or oily substances with water. Their preparation, therefore, involves the breaking up of the emulsified material into exceedingly fine particles in order to allow intimate mixing with the emulsifying liquid. This is accomplished by vigorous churning or agitation, which should be continued long enough to make the mixture permanent. The more vigorous the agitation, the less time it will require to accomplish the emulsion, other things being equal. This point is all-important, for if the oil is not thoroughly emulsified it will separate and float on top, not only reducing the strength of the solution, but leaving pure oil for the last spray from the tank. A good way to test the emulsion is to spread a sheet of tissue or other absorbent paper over the surface of the undiluted emulsion. Then apply a match to the wetted paper. If it burns, it indicates that free oil was absorbed from the surface. Therefore the emulsion was imperfect. Further churning is thus necessary. If the emulsion is perfect, the paper will absorb water and will not burn.

The proper preparation of Bordeaux mixture is most important. If it is not properly made the mixture can not be kept in suspension without continuous and vigorous agitation. It is thus extremely difficult to secure a uniform application and in addition, it is more than probable that the compound so formed is not so active a fungicide. Bordeaux mixture is a complex and insoluble compound of lime and copper suspended in water. This compound seems to be rather unstable and for that reason it should be used only while fresh, or at least not over twenty-four hours old. The solutions, copper sulphate and milk of lime, should be diluted before they are put together. They should also never be mixed while warm. It is also essential to have all the copper in combination with lime, and for that reason a slight excess of lime is advisable. Excess of lime does no harm, while uncombined copper sulphate is very injurious to the foliage. The quantity of lime, therefore, should never be gauged by measure alone. The quality of the lime depends upon the quality of the rock from which it is made and thus varies in different localities. The prepared mixture should, therefore, always be tested before being used. There are two very simple tests, which can be performed by any fruit grower. The addition of a few drops of yellow prussiate of potash solution will cause a dark reddish-brown discoloration when there is insufficient lime in the mixture. When no discoloration follows such addition, the copper has all been combined with lime, and therefore the latter is present in sufficient quantity. If no prussiate is at hand, dip the end of a bright knife blade or other bright steel object into the mixture. After a short time the steel will become coated with metallic copper, or "copper-plated," if insufficient lime has been used. If enough lime is in the mixture, no such coating will take place.

PROPER METHOD OF APPLICATION.

The mode of handling and applying spray mixtures depends upon their physical properties and the class of insect or fungous disease they are intended to combat.

Insecticides act in two ways:

(a) As a poison to be eaten along with the part of the plant attacked.

(b) By contact with the insect.

Fungicides also act in two ways:

(c) By direct contact with exposed mycelium.

(d) By destroying the germinating tube of the fungus before it penetrates the skin.

Thus it will be seen that in applying the mixtures either of two objects must be kept in view, depending upon the class of insects or fungi to be controlled. In cases (a) and (d) the plants or trees must be completely coated with the mixture, so that wherever the insect bites or the fungus spore germinates it will be attacked by the poison or the fungicide. There must be no breaks in the coating of spray mixture. For that reason, use considerable pressure and a fine nozzle in order to get the liquid issuing in the form of a fine mist. Hold the nozzle a little distance away from the leaves or fruit and apply only enough mixture to cover them with fine "dew drops." Extreme care is necessory to accomplish this successfully, but it is highly essential for effective work. If the spraying is continued too long the fine drops will run together and run down and drip off at the lowest point, thus leaving the upper parts largely exposed. In cases (b) and (c) the spray acts by direct contact.

It is therefore necessary to be sure that every part of the tree or plant is struck by the mixture. It is not necessary that the coating of the mixture be maintained. Rather the reverse is often true. The spray has done its work as soon as it strikes, and therefore it does not matter if it runs off. Use, then, a nozzle which delivers the spray in a fine but direct stream so that the mixture will strike with considerable force. The only precaution necessary is to avoid waste and not allow the liquid to run down the trunks and thus saturate the ground around the root-crowns, where it will injure the roots.

In general, the following rule will be applicable:

Paris green and other arsenical poisons, Bordeaux mixture, and ammoniacal copper carbonate should be applied through a fine nozzle as a fine mist and only until the fruit and foliage are completely bedewed.

Kerosene emulsion, kerosene-water mixture, and caustic mixtures should be applied as a fine direct stream, intended to strike with considerable force. Every part of the tree or plant must be struck by the spray, and dripping need be avoided only to prevent accumulation around the root-crowns.

TIME OF APPLICATION.

The time during which an insect pest or a fungous disease can be successfully combatted or prevented is in most cases extremely short. Often a difference of a day or two is sufficient to change success into failure. In spraying for the codling moth, unless the material is applied within a very few days after the blossoms fall and before the calyx lobes close, the spray will not prevent the apples from being wormy; for it is impossible to get the poison into the calyx cavity after that time. In spraying for apple scab, bitter rot, or any other fungous disease, the mycelium of which grows within the leaf or fruit, the fungus must be killed before it penetrates through the outer skin. The spraying material must be upon the plants before the spores of the disease germinate, and preferably before any spores are present. The particular time of application will vary with the different diseases. Repeated sprayings are often necessary, because new spores are formed and because the coating of spraying material may become damaged by the growth of the fruit and leaves, or be washed off by rain.

The regular spraying of apples for the canker worm, codling moth, and apple scab, consists of three applications of Bordeaux mixture and Paris green. The first application should be made just before the blossoms open; the second, immediately after the blossoms fall, and the third, a week or ten days later.

The bitter rot of the apple is a disease concerning which so little is known that no definite recommendations regarding its control can be made at this time. It is possible, however, that if the treatment for apple scab (see above) is followed by an application of Bordeaux mixture about the middle of June, and another ten days or two weeks later, the damage from the disease will be considerably reduced. Later spraying may be needed, especially if the weather is warm and moist. If very late sprayings are necessary, the ammoniacal copper carbonate solution is preferable to the Bordeaux mixture, as it leaves practically no stain upon the fruit.

For the brown rot of the plum and peach, apply Bordeaux mixture before the buds swell, just before the flowers open, when the fruit has set; and if the disease has been serious the year before, or if the weather is favorable for its development (warm and moist), later sprayings should be made at intervals of two weeks until the fruit is nearly full grown. Then use ammoniacal copper carbonate every few days until the fruit is ripe. On stone fruits in full leaf, use Bordeaux made of three pounds of copper sulphate and five to six pounds of lime to 50 gallons of water. This disease can be more easily controlled if the fruits are thinned so that they do not touch one another.

For San Jose and other scale insects, spray when the trees are dormant, using kerosene-whale-oil-soap emulsion, containing 20 per cent of kerosene. This treatment should be followed by an application of more dilute emulsion immediately after the young scales hatch and while they are still crawling about the tree.

Grape diseases, such as black rot, downy mildew and powdery mildew, can be controlled by the following treatment: Apply Bordeaux mixture shortly before the blossoms open, soon after the fruit has set, and then every two or three weeks until it becomes necessary to substitute ammoniacal copper carbonate to avoid staining the fruit. The late applications of copper carbonate may need to be made every few days if rot has been serious in former years, and the conditions are favorable for its developement.

Currant worms can be destroyed by the application of Paris green or some other arsenite as soon as the earliest larvae appear. If it becomes necessary to spray currants or gooseberries after the fruit has attained considerable size, use white hellebore in place of Paris green.

For gooseberry mildew apply Bordeaux mixture just before the buds open; then use potassium sulphid every week or ten days as long as seems necessary.

For plant lice of all kinds use whale oil soap or kerosene emulsion, diluted sufficiently to avoid injury to the foliage.

For red spider and other plant mites use kerosene emulsion sufficiently diluted, to which is added one ounce of flowers of sulphur to each gallon of the mixture.

GOOD JUDGMENT.

It is impossible to give definite directions for spraying which will cover all cases and forestall all complications. The fruit grower must be prepared for emergencies. He must be ready to spray upon short notice at almost any time, and must be able to decide for himself when spraying becomes necessary. He must be ever watchful for the appearance of any injurious insect or fungous disease, and must be able to determine what material it will be best to use in any given case. If brown rot breaks out on his plums, he is the one who must determine whether or not the plums are so near maturity as to render it necessary to use ammoniacal copper carbonate instead of Bordeaux mixture. If he should wait to consult some authority before beginning operations his crop might be ruined. So it is in all matters connected with spraying. The fruit grower must act for himself. And the more intelligently he does his work the more certain will be his success.

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FORMULAS.

Mixture.	Quantities for 5 gallons of mixture.	Quantities for 50 gallons of mixture.	Quantities for 100 gallons of mixture.	To be used against	Method of preparation.
Paris green Fresh lime Water	½ oz. ½ oz. 5 gals.	4 ozs. 4 ozs. 50 gals.	½ lb. ½ lb. 100 gals.	All chewing insects—codling moth, canker worm, curculio, currant worm, leaf skeletonizer, potato beetle and the like.	Make a thin paste of the lime by slaking it with water; strain; place lime paste and Paris green in a bottle or jug and shake vigorously until thoroughly mixed; then add to full quantity of water. For potato beetles the proportion of poison may be increased to 1 pound to 125 gallons of water.
Scheele's green or copper arsenite Fresh lime Water	¾ oz. ¾ oz. 5 gals.	6 ozs. 6 ozs. 50 gals.	¾ lb. ¾ lb. 100 gals.	All chewing insects.	Proceed as for Paris green.
Arsenite of Lime: White arsenic Sal soda Fresh lime Water to make	 ¼ oz. 1 oz. ½ lb. 5 gals.	 2 ozs. ½ lb. 4 lbs. 50 gals.	 ¼ lb. 1 lb. 8 lbs. 100 gals.	All chewing insects.	Boil arsenic and soda in small quantity of water in an iron pot not used for other purposes, until all the arsenic is dissolved. Slake the lime, making a thin paste of it; strain and add to full quantity of water; then add soda and arsenic solution, and stir for a few minutes.
Arsenate of Lead: Lead acetate Soda arsenate Water	 1¼ ozs. ½ oz. 5 gals.	 12½ ozs. 5 ozs. 50 gals.	 1¾ lbs. 11 ozs. 100 gals.	All chewing insects.	Pulverize and dissolve the acetate and arsenate separately in small quantities of water; add separately to full quantity of water, and stir for a few minutes. This is especially valuable on tender foliage, such as peach and plum, and can be used stronger with impunity.

Kerosene Emulsion: Kerosene............ Whale-oil soap..... Or soft soap........ Water...............	2 gals. ½ lb. 1 qt. 1 gal	Stock emulsion to be diluted as directed below.			Slice the soap finely and dissolve in the water by boiling; add the boiling solution (away from the fire) to the kerosene, and stir or churn violently for from five to eight minutes, until the mixture assumes a creamy consistency. If a spray pump is at hand pump the mixture back upon itself with considerable force for about five minutes. If no soft soap or whale-oil soap is at hand, use one pound common soap dissolved in the boiling water.
Kerosene Emulsion.. Water to make.......	3 qts. 5 gals.	7½ gals. 50 gals.	15 gals. 100 gals.	Scale insects, larger plant bugs, larvae and beetles.	Use rain water in the dilutions, if possible. If hard water is used "break" it with lye (¼ pound to 50 gallons) before using.
Kerosene Emulsion.. Water to make.......	2½ pts. 5 gals.	3⅛ gals. 50 gals.	6¼ gals. 100 gals.	Plant lice and soft bodied insects.	Prepare as for scale insects.
Kerosene-Milk Emulsion: Kerosene........... Sour milk	2 gals. 1 gal.	Use as directed for the kerosene-soap emulsion.			No heating is necessary in this case. Thorough churning or pumping as directed above will effect the emulsion. This emulsion is valuable where hard water must be used, no breaking with lye being necessary.
Bordeau Mixture: Copper sulphate... Fresh lime......... Water...............	6½ ozs. 7 ozs. 5 gals.	4 lbs. 4 lbs. 50 gals.	8 lbs. 8 lbs. 100 gals.	All fungi, especially all penetrating fungi.	Dissolve copper sulphate in small quantity of water; slake the lime carefully, making a thin milk of it. Now dilute the two solutions each to about half the total quantity of mixture to be made; mix them together and stir vigorously for a few minutes. Test with yellow prussiate of potash solution, or knife blade, and add more lime if necessary.

Formulas—Concluded.

Mixture.	Quantities for 5 gallons of mixture.	Quantities for 50 gallons of mixture.	Quantities for 100 gallons of mixture.	To be used against	Method of preparation.
Ammoniacal Copper Carbonate: Copper carbonate.. Ammonia 26°....... Water to make.....	 ½ oz. ½ pt. 5 gals.	 5 ozs. 3 pts. 50 gals.	 10 ozs. 6 pts. 100 gals.	All fungi.	Make a thin paste of the carbonate with water. Dilute one-third the ammonia seven or eight times; pour on carbonate; stir vigorously and allow to settle; pour off clear liquid. Dilute another one-third of the ammonia five or six times and add to residue left; stir and allow to settle as before; pour off clear liquid. Dilute the rest of the ammonia two or three times and add to the residue. If the ammonia is full strength this should all enter into solution; if not, more ammonia may be added until the carbonate is entirely dissolved. Rain water should be used in diluting the ammonia. The solution should be clear. Dilute to spraying strength.
Sulphide of potash .. Water.................	2 ozs. 5 gals.	20 ozs. 50 gals.	2½ lbs. 100 gals.	Fungi which grow with their mycelium exposed; mildews of gooseberry and rose, and powdery mildew of grape.	Dissolve the sulphide in warm water and dilute to spraying strength. The solution loses its strength quite rapidly and should be used only while fresh.
Bordeaux and Arsenites Combined: **Bordeaux mixture..** **Paris green.........** **or** **Scheele's green....** **or** **Arsenate of lead ...**	**Usual strength as given above.**			**Fungi and chewing insects.**	If Paris green or Scheele's green is used, prepare the Bordeaux mixture as directed above. Wet the powder by shaking in a bottle and add to the completed mixture. Stir vigorously before using. If arsenate of lime is used, add enough additional milk of lime to the Bordeaux to make the arsenite, then add the arsenic and soda. For arsenate of lead, dissolve the lead acetate and soda arsenate as above directed and add these solutions separately to the water which is used to dilute the milk of lime; stir well and add lime; then add diluted copper sulphate solution and stir.

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